

THE IRON AGE

Established 1855

New York, January 15, 1914

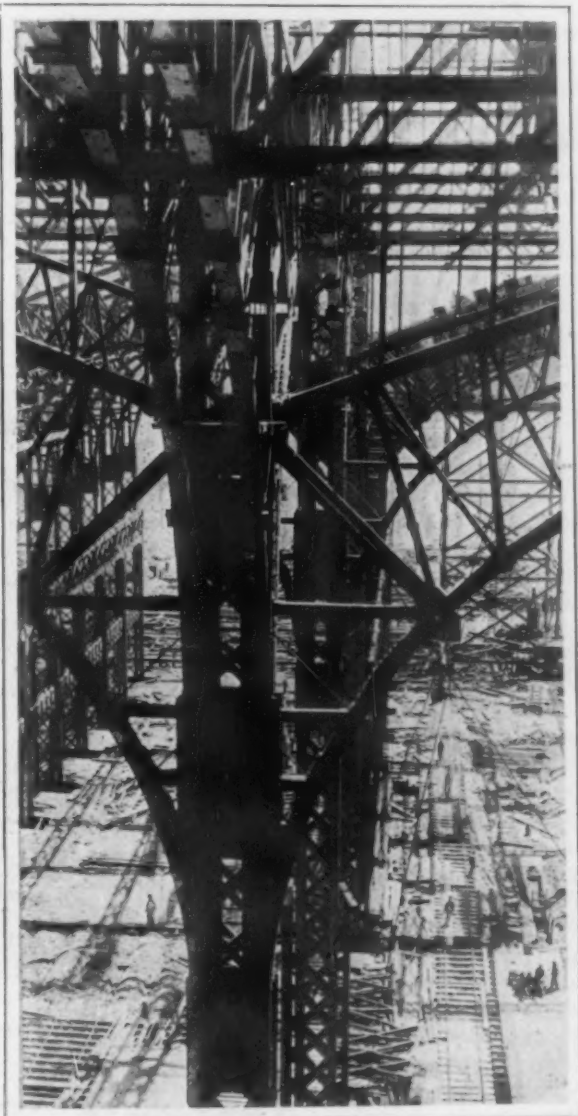
Vol. 93: No. 3

The Machinery Palace at San Francisco

Details of the First Structure to Be Completed—
The Use of Wood for Columns and Trusses a
Fea-
ture

THE first exhibit structure to be completed on the 625 acres constituting the Panama-Pacific International Exposition grounds at San Francisco is the palace of machinery, which stands clear of scaffolding and complete in its magnificence. It is not only the first to be finished; it is also the largest building at the exposition, and likewise the largest wooden structure in the world. Indeed there is said to be no record in the history of architecture of any wooden building's ever having been erected as large as this. Its outside dimensions are 368 x 968 ft.; its area is 369,000 sq. ft. and its volume is 38,000,000 cu. ft., while its height averages 103 ft. with a maximum of 135 ft. This magnificent pile cost exactly \$659,665 and is placed at the disposal of machinery manufacturers for the free housing of their products during a period of nine and a half months, in which time the world will gather in San Francisco.

While the machinery palace is of wood it assumes the appearance of splendid permanency through the medium of the imitation Travertine marble, which was first used successfully by Paul E. Deniville on the upper part of the Pennsylvania Railroad station in New York. It is tinted to a dull cream color and thus the glare resulting from vast structural areas of white is avoided



PART OF ONE OF THE WOODEN COLUMNS AND THE TRUSSES

In the Machinery Palace at the Panama-Pacific International Exposition, the largest building ever constructed entirely of wood, all of the arch trusses and columns were completed on the ground and then hoisted into position. The palace, which is 967 ft. in length and 137 ft. high, is constructed of wooden trusses. From the ground the point of connection of the four arch trusses to the column is 101 ft. Each of the arch trusses weighs 5 tons and the columns 28 tons each. The trusses are 75 ft. in length from center to center of span and are made of wood, no metal being used.

and eye strain reduced.

This color has been adhered to throughout the exposition, and involves the magnificent main group of eight exhibit palaces which occupy a central position. This central group of palaces covers a space 2756 ft. long and 1250 ft. deep, with three interior courts. These, with their extensions, have been developed longitudinally north and south in such a manner as to produce a maximum diversity of effect and to afford the greatest sheltered areas around the palaces whose walls are the walls of the courts.

It is immediately to the east of the group of eight exhibit palaces that the palace of machinery stands, balancing on that side the palace of fine arts, which is to the west of the main group.

In architectural composition the palace of machinery is Roman and there is evident influence on the mind of the designer of the old Roman baths. The decoration is classic in form but modern in expression, suggesting machinery and the marvels of invention. The principal feature in its interior arrangement is three arched aisles or bays, 75 ft. wide and 101 ft. high, running

through its entire length of 968 ft. On each side of the main structure there are side aisles, 70 ft. wide, covered with shed roofs 41 ft. high to the soffit of the trusses. Three transverse aisles of the same

width as the longitudinal aisles and 132 ft. high divide the area formally.

Adjoining the palace of machinery will be the gas and fuel building in which will be generated the power for the use of exhibitors requiring steam for use in connection with their displays.

An effort is now being made that appeals strongly to such manufacturers of minor devices as feel that the expense accompanying an individual exhibit requiring the services of an attendant or attendants is irksome. These are invited to group their displays, provision being made, of course, that competing devices be not grouped together, and the slight expense divided among the several companies so exhibiting. Such inventions and devices as fuse cut-outs, accessories to boiler and steam engines, valve gears, governors, methods and appliances for testing and recording the performance of engines, turbines, boilers, condensers and their auxiliaries lend themselves to most interesting exhibit displays. A group of all of the Diesel and heavy oil engines, a number of which will be directly connected to direct-current generators, will be employed for exposition uses and will be installed on an exhibit basis. Other groupings are being made of packing, gaskets, lubricants, lubricators and all electrical apparatus.

A 5000-kw. steam turbine auxiliary plant will be established on the grounds to provide against the most remote possibilities of an interruption in the power which is being provided by the local electric power company. This power for the exposition is from the hydroelectric system of the Pacific Gas & Electric Company. Supplementing this, however, the company has installed in San Francisco a 60,000-kw. plant from which power could be delivered to the exposition instantly in case of any unanticipated interruption. Still further bulwarking the exposition's security in a continuous supply of power, will be this 5000-kw. steam turbine auxiliary plant which it is probable will be placed on an exhibit basis.

The floor of the machinery palace is designed for a load of 200 lb. per sq. ft., and there is adequate foundation firmness to insure rigidity against the stress of any exhibit that may be placed. The fire protection is complete. A double deck sprinkling system on the roofs, with overhanging sprinklers, capable of throwing a sheet of water on the walls from the eaves and interior sprinklers, of adequate number and size, will complete the protection against fire afforded to the exhibitors whose space in this magnificent palace will be given free by the exposition authorities.

The exposition is to be of contemporaneous character, rather than historic. Exhibits of products antedating 1905 in construction will not be reviewed for award, and on account of space limitations the displays must be selective in character. Precedence will be given to those applications which contemplate exhibits having distinctive features from an engineering or educational point of view.

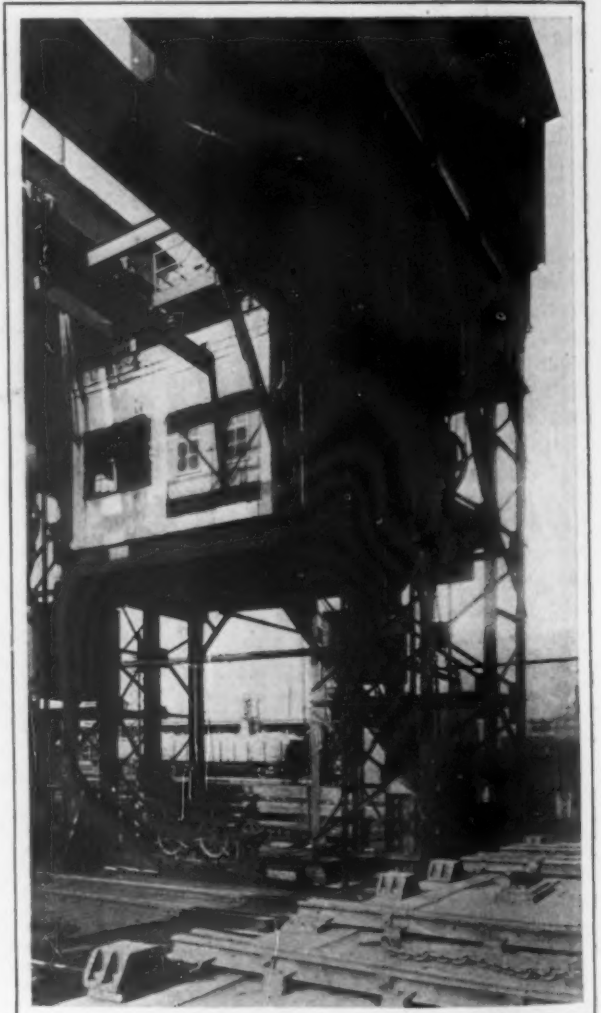
Already applications are on file covering two-thirds of the available space in the palace of machinery. The final allotment of space will be made early in 1914, so that prospective exhibitors are urged to hasten with their proffered exhibits, remembering that this exposition will have a greater representation in visitors, official and otherwise, from the Latin-American countries of South America than ever attended any previous exposition, and the Orient is made a neighbor by the Panama Canal, which event the exposition will celebrate mightily.

ST. GEORGE TRANSFER BRIDGE

Interesting Use of Screws, Gears and Sheaves for Raising Heavy Loads

The recently completed freight transfer bridge of the Baltimore & Ohio Railroad, at St. George, borough of Richmond, New York City, affords an interesting example of the application of screws, worm and spur gears, sheaves and counterweights for raising and lowering heavy loads. This railroad has no direct entrance to New York City or to any of the freight terminals on the west bank of the Hudson River. The passenger traffic is handled over the tracks of the Central Railroad of New Jersey, but the freight trains leave the main line at a point about 16 miles west of the terminal at Jersey City and the line runs directly across country to the southern end of Elizabethport, crossing Arthur Kill on a long, high-level trestle and drawbridge into Staten Island. From this point, the tracks of a local steam road, the Staten Island Rapid Transit Railway, are used to St. George.

The trains as run into the St. George yard are broken up and run over freight transfer bridges upon car floats for lightering to various points in New York Harbor. The old type of bridge, which was in service at St. George, was a track platform on a pontoon. This arrangement is open to the objection that silt will get under the pontoon and prevent it from moving with the difference in the level of the tide, but this is not as serious as the



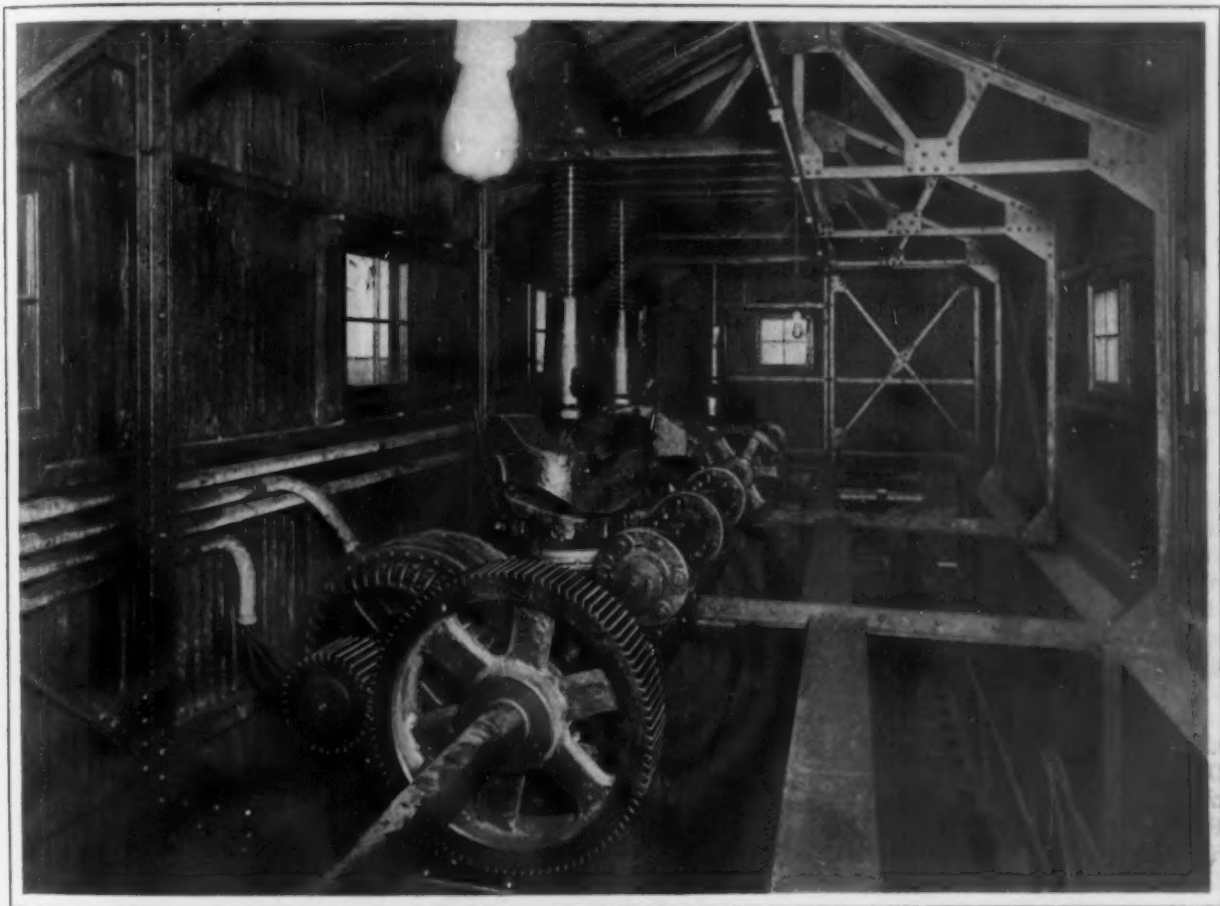
The Water End of the Apron with the Two Sets of Counterweights. The Two Houses Containing the Raising and Lowering Mechanism Are Shown at the Top of the Engraving with the Control Room Between

jamming caused by the ice in the winter season which fills the slip and either prevents the car float from entering at all or else lodges under the pontoon and raises it out of line. Another objection is that car floats which are more heavily loaded on one side than on the other are hard to handle, and in some cases an hour or more is lost before the float is finally docked and the cars run off. With a view to overcoming these objections, the engineers of the bridge department of the railroad developed a new type of transfer bridge, which is modeled after one erected several years ago at the company's large freight terminal at Locust Point, Baltimore Harbor.

The bridge at St. George is double tracked and consists of two parts, which are known as the bridge and the apron, the former being 85 ft. long. It is mounted on trunnions at the shore end, while

screws and is designed to carry a load of 275,000 lb.

The apron, which is 30 ft. long, is hinged at the inner edge to the bridge and is supported at the outer end by cables and a double system of counterweights arranged on endless cables. A view of the counterweights and a portion of the system of wire ropes is presented in one of the engravings. The cable from the rear counterweight, which is the upper one in the engraving, passes over motor-driven drums in the house directly above. It then passes around an equalizer sheave which carries the apron and upward and over a second large sheave and drum to a pick-up counterweight which is shown resting upon the floor of the tower which is its normal position when not in operation and guideways are provided in the tower for alignment during operation. As the name indicates, this

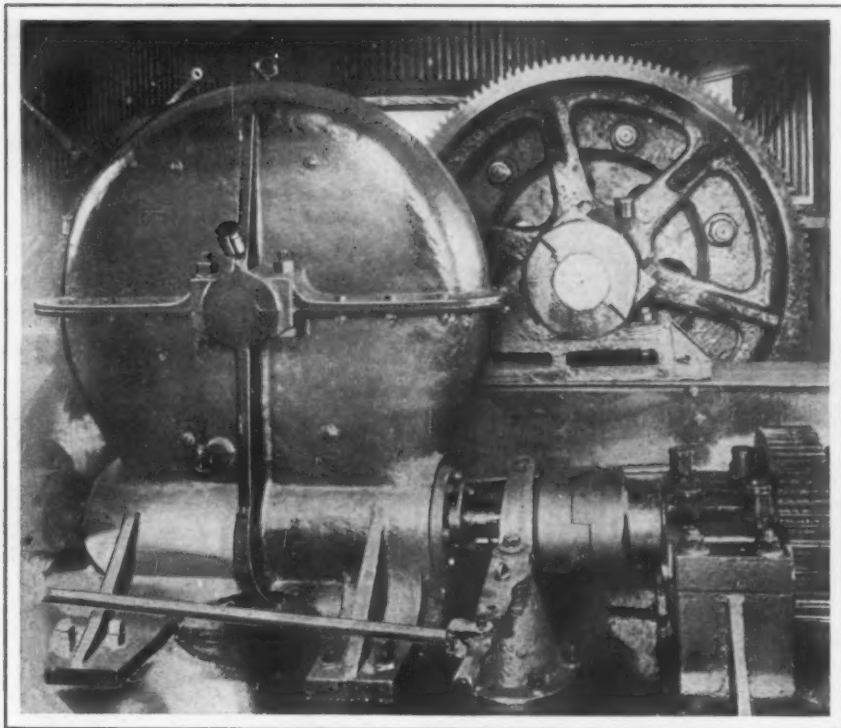


View in the Bridge House Showing Three of the Four Screws Employed to Adjust the Level of the Bridge

the outer one is supported by cable counterweights, which carry 90 per cent. of the dead load. The remainder of the dead load and the entire live load are supported by four screws having an external diameter of $8\frac{1}{2}$ in. and a length of 29 ft. Three of these screws are shown in one of the engravings, together with one of the two 50-hp. motors, which are used to drive them. The power is transmitted from the motors through the pinions and large spur gears shown to a longitudinal shaft. On this shaft in front of each of the screws is a worm which meshes with a worm gear that is fastened to the trunnion and saddle of each screw. In the trunnion is mounted a bronze nut, having a thread 27 in. long. This nut is rotated by the worm gear and drives the screw to raise and lower the bridge. These screws are capable of lifting the bridge, together with two trains of fully loaded cars through a height of 15 ft. A thrust roller bearing is provided to take care of the load on the

counterweight is made up of a number of sections which are picked up automatically according to the train load passing over the apron as the level is lowered and are dropped back in place as the apron rises. The drums which are shown in the interior view of the apron house are motor driven through a reduction gear, having a ratio of 4 to 1, a portion of this gear being shown in the lower right corner. These drums are used to set the apron at the proper level to meet the incoming float, the power being transmitted from the horizontal shaft through a worm cut on it to a worm gear, which is shown inclosed at the left. The worm gear shaft has a pinion cut solid on it which meshes with a large spur gear attached to the drum. The cable passes around the rear drum shown back of the worm gear housing and down to the counterweight and up and over the large drum at the right. This cable passing from one drum to the other is shown in this engraving.

After the float has been fastened to the apron the fluctuations in level due to the loading or discharging of cars are taken care of by the pick-up counterweight, as has been explained. It is possible to adjust the apron to correspond with any change in the level of a float which comes in heavily



The Drums Used to Adjust the Level of the Apron

laden and listed as one side is toggled fast to the apron and then the level of the other side is adjusted by either paying out or taking up the cable operated by the drums, there being two sets of drums, one on either side of the apron, geared together and a sufficient number of laps of cable around the drums to prevent slippage.

The general design of this structure was originated by the bridge department of the Baltimore & Ohio Railroad, while the details of design were prepared by the Earle Gear & Machine Company, Philadelphia, Pa., which manufactured all of the operating machinery and supervised the erection. The steelwork used was fabricated and erected by the Fort Pitt Bridge Works. The bridge has been in service for almost one year and has given satisfactory service under some severe operating conditions.

Record Year in British Shipbuilding

The British shipbuilding industry turned out a greater tonnage in 1913 than ever before in its history. Estimates cabled to this country indicate that 933 war and merchant ships of 2,186,607 gross tons were launched from private yards in the United Kingdom during the year, a record which is not likely to be exceeded in 1914 from present indications.

Swan, Hunter & Wigham Richardson, for the second year in succession, lead the list of builders with a record output. Their total is 22 vessels of 107,636 tons. Sir W. G. Armstrong, Whitworth & Co. come next with 9 vessels of 99,333 tons and William Gray & Co. take third place with 18 vessels of 86,000 tons. In marine engineering John Brown & Co. stand first, with 239,000 i. hp. to their credit.

Power for Electrodeposition of Metals

A symposium on the power problem in the electrolytic deposition of metals was held on January 9 at the Engineering Societies Building, 29 West Thirtieth street, New York City. The meeting, which was held under the auspices of the American Institute of Electrical Engineers, was a joint one with the New York section of the American Electrochemical Society and the New York members of the American Society of Mechanical Engineers. Dr. C. O. Mailloux, president of the Institute, presided, and papers were presented dealing with the problem from the standpoints of the three industries represented.

The first paper, by Lawrence Addicks, superintendent of the United States Metals Refining Company, dealt with the problem from the viewpoint of the electrochemist. This referred to a copper refining plant as typical of this general class of electrolytic processes and discussed the limitations imposed by present practice upon the amperage, voltage and kind of current used, the separation of circuits, the high load factor, the use of steam for warming

the electrolyte and the size of plant installed.

H. E. Longwell, mechanical engineer, Westinghouse Machine Company, dealt with the mechanical side of the problem and pointed out that a steam plant of the geared turbine type was the best suited. The exhaust from the auxiliaries, he suggested, could be used for heating the electrolyte, and he estimated that 40 per cent. of the steam required for generating the current could be supplied by waste heat boilers, which, however, were only run six days a week and necessitated the use of reserve boiler equipment to carry the plant over the week end. The geared turbine plant was in his opinion better than the combination plant employing reciprocating engines, and such a plant could be built for a cost of \$75 per kilowatt.

The electrical side of the problem was discussed by F. D. Newbury, division engineer, Westinghouse Electric & Mfg. Company. He favored a combined alternating-current turbo-generator and converter unit for the power supply as economical, reliable and flexible, especially where large units and long transmissions are required.

In the discussion following the papers one of the speakers pointed out that the efficiency on partial loads favored the use of reciprocating engines. Another speaker spoke of depositing the metal rapidly to eliminate the necessity for heating the electrolyte and stated that the cost of heating operated against electrolyte temperatures above 135 deg. F. He also pointed out the brittle, rough deposit that accompanied an accelerated rate.

The Deforest Sheet & Tin Plate Company, Niles, Ohio, has increased its capital stock from \$400,000 to \$600,000, in order to provide for the expansion of its business.

Blast Furnaces of the Reading Iron Company

How the Old Plants Were Modernized —Extensive Ore Storage and Handling Facilities—Concrete Ore Bins

Economy in operation has become a matter of vital importance to Eastern blast furnace interests. The competition of the Central West, Lake shore and Southern furnaces and the possibility of the entry of foreign pig iron as a factor in the Eastern market, in combination with other conditions, have produced a situation which demands that Eastern furnaces be thoroughly modernized and equipped with labor saving devices. Eastern furnace plants, built in recent years and plants that have been modernized are, for the most part, well prepared to meet competition and low prices. On

and unloading the winter's ore supply during the summer and autumn are very important elements in the cost of operation.

At the Crumwold plant, the extent of the ore yard was somewhat limited by local conditions. By reference to the plan shown in Fig. 1 it will be seen that a railroad track is provided on each side of the storage yard, one track being located on the extensions of the piers carrying the stock bins and the other being placed at ground level on the opposite side of the yard. Generally, ore is unloaded on the tracks next the bins and distributed in the

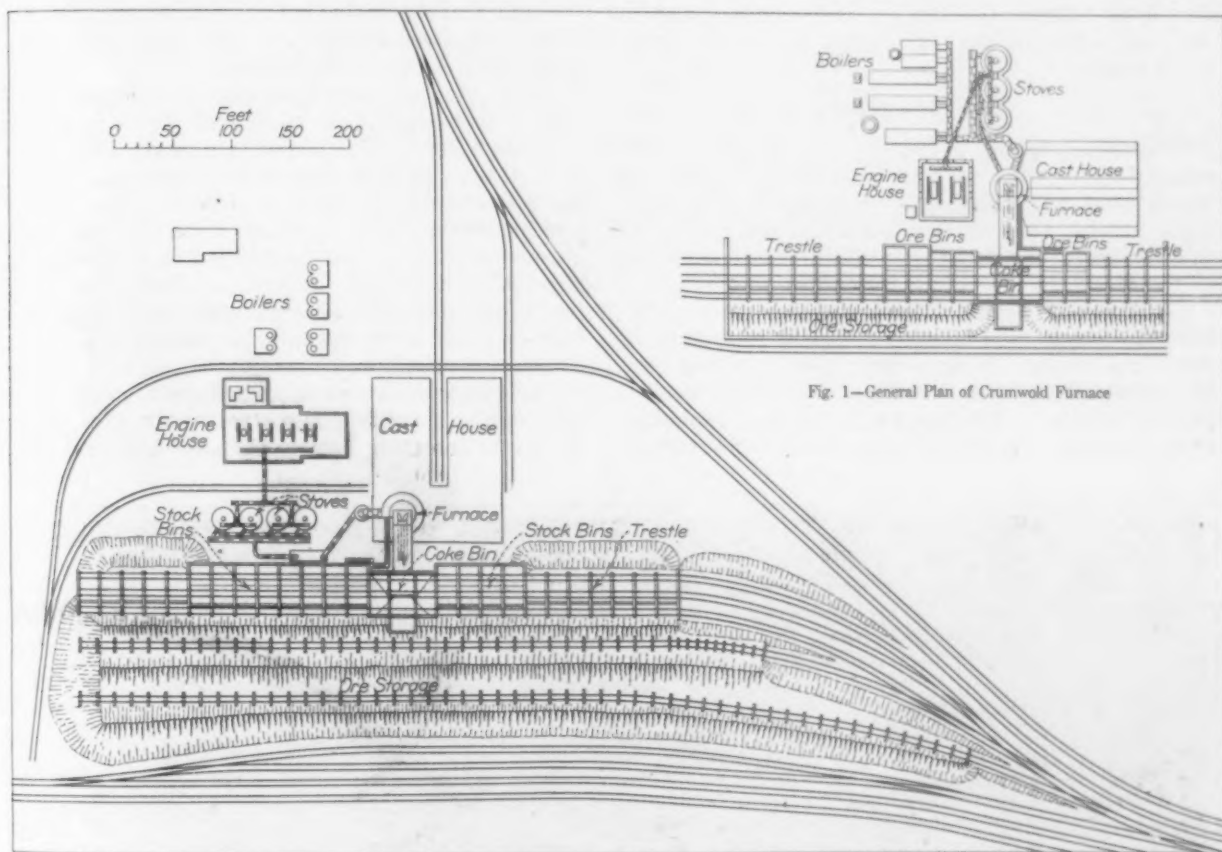


Fig. 2—General Plan of Keystone Furnace Plant

the other hand, plants that have not been remodeled are necessarily operating in good times at a considerable disadvantage, while in bad times they cannot be operated without a loss.

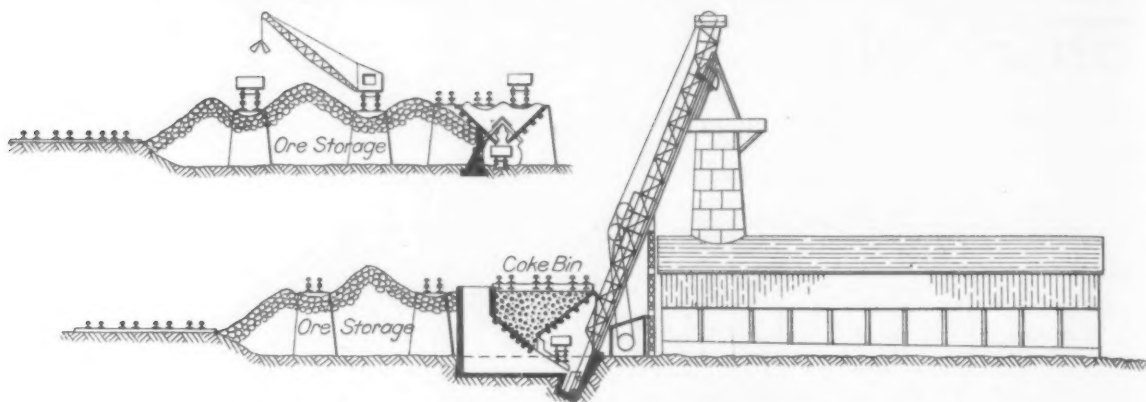
The Reading Iron Company's blast furnace plants are located at Emaus and Reading, Pa., the former being known as the Crumwold furnace and the latter as the Keystone furnace. These plants were originally built as "barrow hand-filled" furnaces with vertical hoists. Realizing the situation set forth above, the company decided some years ago to modernize both plants. The general arrangements of the Crumwold and Keystone plants are shown in Figs. 1 and 4 respectively.

THE ORE STORAGE YARDS

One of the most important auxiliaries of a furnace plant, particularly in the East, is an ample ore storage yard. The advantages of transporting

yard by means of a self propelled crane equipped with a "grab" bucket. The unloading track as well as the tracks over the bins, are so graded that, after unloading, the cars are dropped by gravity to the tail track indicated. In filling the bins, ore is taken from the stock pile by the crane and either discharged directly into the bins or into a drop bottom car which is in turn transferred over and dumped into the bins. During the larger part of the year, a considerable quantity of the current ore supply is discharged directly into bins on its arrival at the plant.

At the Keystone plant, the ore storage yard, while much the same as the Crumwold yard in principle, is much larger in capacity. The plan shown in Fig. 2 and the elevations Figs. 3 and 4 indicate that three elevated railroad tracks extend throughout the length of the storage yard; any one or all of these tracks may be used for unloading ore or



Figs. 3 and 4—Section Elevation of Keystone Plant Showing Elevated Tracks

for loading cars to be transferred over the bins. All tracks are carried by steel girders resting on reinforced concrete piers, the track next the bins being supported on extensions of piers forming part of the bin construction. While the self-propelled crane of the "whirly" type has been adopted for both plants, the design and arrangement is such as to permit the installation of a bridge traveling crane.

THE BIN SYSTEMS

Various designs of stock bins have been developed from time to time embodying the use of wood, steel or a combination of both. These designs are all, however, subject to serious objections arising from the decay of wood and the corrosion of the steel.

At the plants under discussion, the entire equipment of stock bins and trestle piers are built of reinforced concrete, the only wood entering into the construction being the maple linings of the bins proper, which is so installed as to be capable of easy renewal. There is thus provided a bin system

which is practically indestructible, does not decay, require painting or expensive renewals. The first example of the use of reinforced concrete for stock bins was at the plant of the Richard Hecksher & Sons Company (now Alan Wood, Iron & Steel Company) and was described in *The Iron Age* for July 25, 1907. This plant and the plants under discussion were designed by the same engineers, Frank C. Roberts & Co., Philadelphia.

The ore and stone bins are of the double type with a railroad track supported by steel girders over each row. The Crumwold plant is equipped with eight ore bins and four stone bins, while at the Keystone plant there are provided 16 ore bins and eight stone bins; in both instances the row of bins next the ore yard is devoted to ore. The sections of the bottom of ore bins adjacent to the gates, are made of cast iron plates containing pipe coils through which steam is circulated in the winter to prevent freezing.

An electrically operated bottom dump transfer car, equipped with scales, transports the ore and limestone from the bins to the skip hoist. The bin

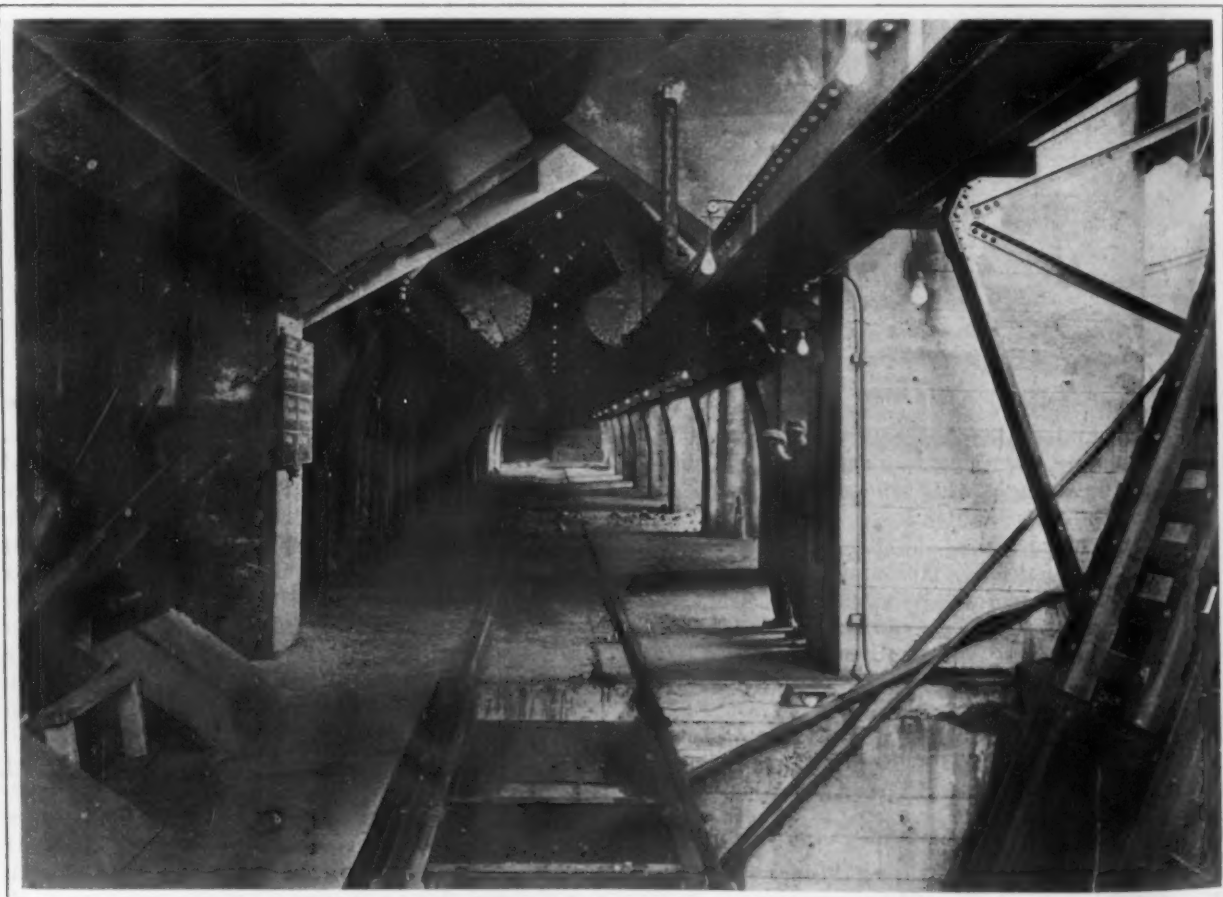


Fig. 6—Design of Bins, Showing Their Construction

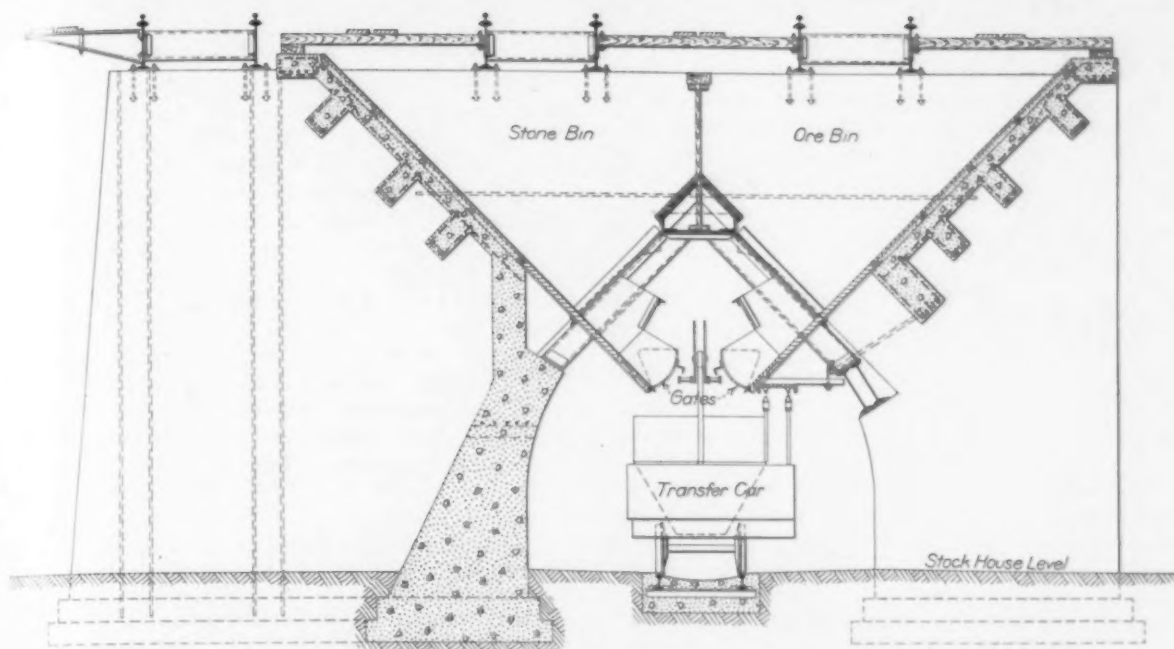


Fig. 5—Design of Stock Bins and Position of Transfer Car

gates are of the pivoted type arranged to be operated by a lever carried by the transfer car, thus avoiding the expense and complication of a separate lever and operating apparatus for each gate.

One coke bin of large capacity discharging directly into the skip cars, is provided at each plant. Coke may be delivered to the bin on any one or all of three overhead tracks. The coke on its way to the skip cars passes over screens, the braise falling into a pit located under the coke bin. This pit extends beyond the coke bin a distance sufficient to enable the braise to be taken out of the pit by a bucket and traveling crane located on the outer track over the coke bin.

The general design of the stock bins and the relative position of the stock transfer car are shown in Fig. 5. The design of the bins is further illustrated by Figs. 6 and 7.

FURNACE CONSTRUCTION

Both furnaces are equipped with double skips and furnace charging apparatus of the Roberts type. The hoisting equipment in each case consists of Otis steam engines located at ground level. The starting levers for the hoist engines, the control of the bell cylinders, the bell indicators and the furnace sounding apparatus are all located in the hoist engine house.

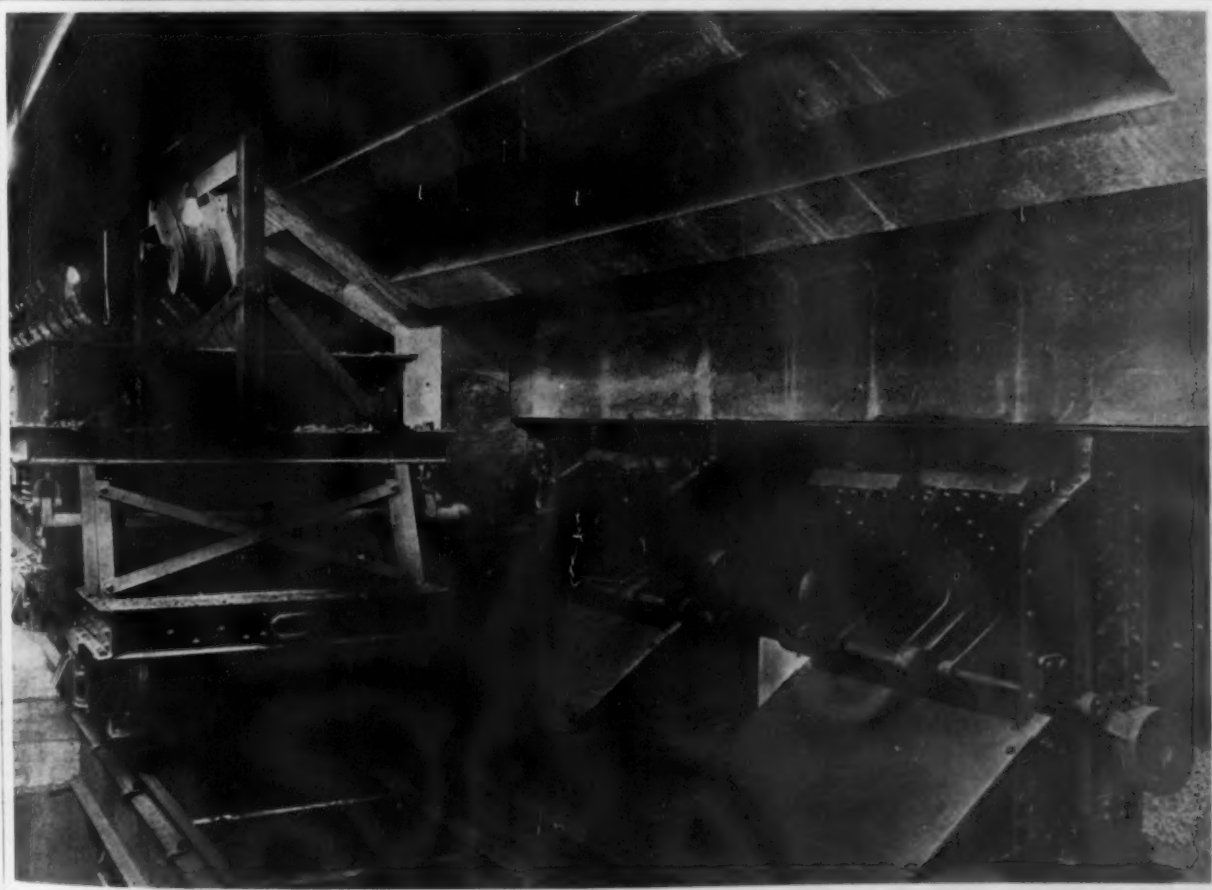


Fig. 7—Design of Bins, Showing Transfer Car

The furnaces proper are constructed with steel shells supported on cast iron columns; the bosh cooling equipment consists of a combination of cooling plates and spiral water trough surrounding the larger portion of the bosh. Crumwold furnace is 75 ft. high with a bosh diameter of 16 ft. 1 in. and a hearth diameter of 10 ft. Keystone furnace is 79 ft. high with a bosh diameter of 18 ft. and a hearth diameter of 12 ft.

The stove equipment at the Crumwold furnace is being replaced by three Roberts stoves of the three pass type; while the stove equipment at the Keystone furnace consists of four Massick & Cooke three pass stoves built some years ago.

POWER PLANT

No additions, except electric generators and engines, have been made to the power at either plant. At the Crumwold furnace the power equipment consists of 1500 hp of boilers; two blowing engines having 84 in. diameter Southwark air cylinders by 84 in. stroke and the usual outfit of pumps, electric engines and generators. The Keystone furnace is equipped with 2000 hp of boilers; two blowing engines having air cylinders 76 in. diameter by 48 in. stroke; two blowing engines having air cylinders 84 in. diameter by 60 in. stroke and the necessary pumps, electric engines and generators.

British Galvanized Sheet Trade

A cablegram in *The Iron Age* of December 18, 1913, announced the formation by the British galvanized sheetmakers of an association based on regulation of output. London journals point out that the failure of the old association in 1910 was caused by outside competition rather than by internal dissension. Conditions have improved lately. The export trade in particular has expanded greatly, especially to India, Argentina and Australia. The total exports for the 11 months to December 1, 1913, amounted to 700,540 tons, an increase of about 100,000 tons over those for the same period in 1912. It is evident that 1913 made a new record. It is believed, however, that any undue advance in British export prices will bring on competition, particularly from the United States.

The alloy Tantiron is a special grade of cast iron made in England and very high in silicon. It has special resistance to corrosion and is therefore recommended for use in pipes and fittings in chemical works and other places where acid attack is the chief consideration. It is said to be very brittle and so only suitable for small castings.

The Railway Supply Manufacturers' Association will hold its annual convention and exhibit in conjunction with the Master Car Builders' and the American Railway Master Mechanics' Associations, on Young's Million Dollar Pier, Atlantic City, N. J., June 10 to 17.

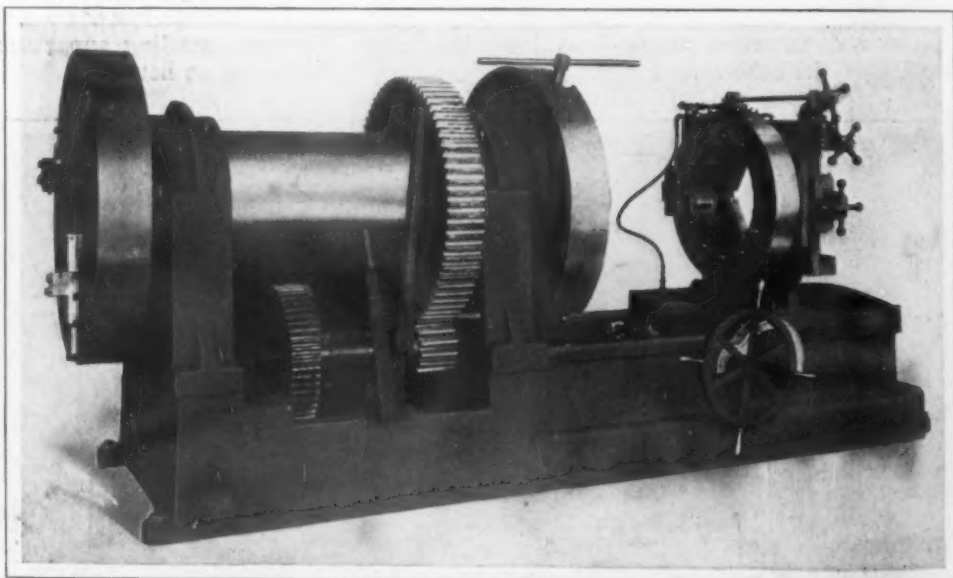
Threading Machine for Large Pipe

A new 16-in. pipe threading and cutting-off machine has been brought out by the Williams Tool Company, Erie, Pa. This is known as the No. 6 heavy type machine, and while many of its general features are similar some changes have been made in its design as compared with the company's No. 5 heavy type, 12-in. machine. This machine has a capacity for pipe ranging from 7 to 16 in. in diameter and it is of very heavy construction throughout.

The dies are set with a lead screw instead of a cam lever as in the smaller machine referred to. The die head rests on a sliding carriage that is moved backward and forward by a machine cut rack and pinion operated by a handwheel on the front of the machine. The carriage has a travel of 36 in. and the die head can be brought up to the gripping chuck.

In cutting off the pipe instead of being steadied by a scroll chuck is supported by two universal V-guides. The cut-off is mounted on one of these guides and is operated by a handwheel. The V-guides and cut-off slides are fitted with gibs to take up wear.

The hollow spindle through which the pipe passes rests in a strong headstock, which is firmly bolted to the head of the machine and dowelled to prevent it from getting out of line. The bodies of the three-jaw gripping chuck at the end of the spindle are steel forgings fitted with tool steel inserts for the grips so that in case of wear the entire jaws do not have to be replaced but only the grips. The chuck jaws are operated by a hand lever. The spindle has four changes of speed that are secured through gears controlled by two levers in front of



A Recently Developed Machine for Threading and Cutting Off Pipe Ranging from 7 to 16 In. in Diameter

the machine. The upper lever operates a friction clutch on the driving gears for stopping the machine. The gears are of coarse pitch, machine cut and extra heavy.

The bed of the machine is unusually heavy and, instead of being mounted on legs as in the lathe type, rests on the floor. The machine is driven by 10-hp. constant-speed motor. It occupies a floor space of 5½ x 13 ft. and weighs 1400 lb.

The American Shipbuilding Company, Cleveland, Ohio, has taken a contract from the Kelly Island Lime & Transport Company for a sand steamer to be delivered next spring. The boat, which will be built at the Lorain yards of the company, will be 175 ft. long and 38 ft. wide.

Accident Prevention Work and Results

A Brief Statement of the Activities of the National Metal Trades Association—Some Preventive Measures

—BY WILLIAM H. DOOLITTLE*

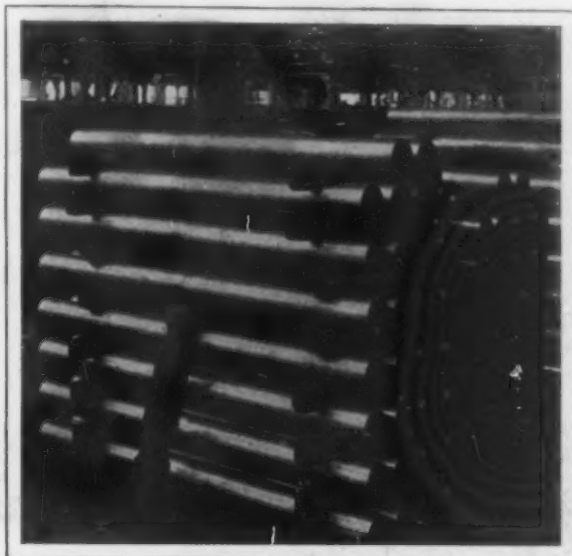
Regarding the results to be obtained from accident prevention work we have good reason to be optimistic. The industrial world is growing safer. The tabulated statistics of injuries in the industrial plants in the United States bear out this statement. While no well-informed person takes the stand that all accidents where the human element is a factor may be avoided, there is a pronounced tendency toward taking all proper preventive measures before classing any accident as unpreventable.

The National Metal Trades Association, which has for several years been giving special attention to industrial safety, is now continuing the campaign with great vigor. Every plant in the association membership is regularly inspected and the working conditions which affect the personal safety of the operatives are noted and commented on by the association's official safety

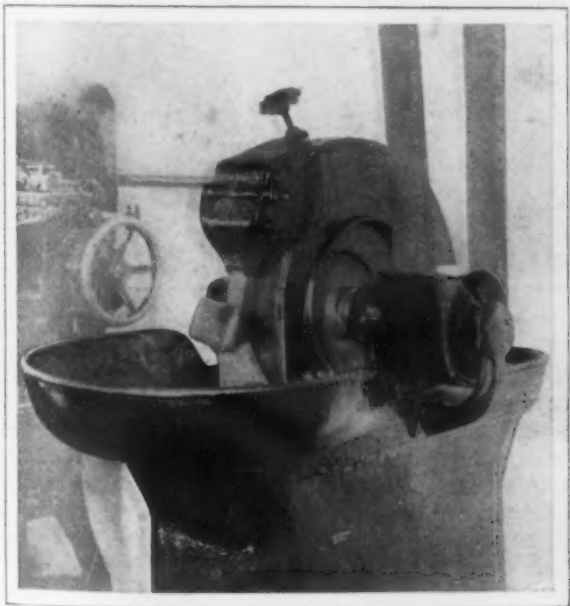
members, the association conducts industrial safety meetings in different parts of the country. Addresses, illustrated by picture plays and stereopticon views, are given and the industrial safety exhibit is used to instruct the individual workmen.

One of the accompanying illustrations shows a safe method of piling round shafts as practiced in the plant of

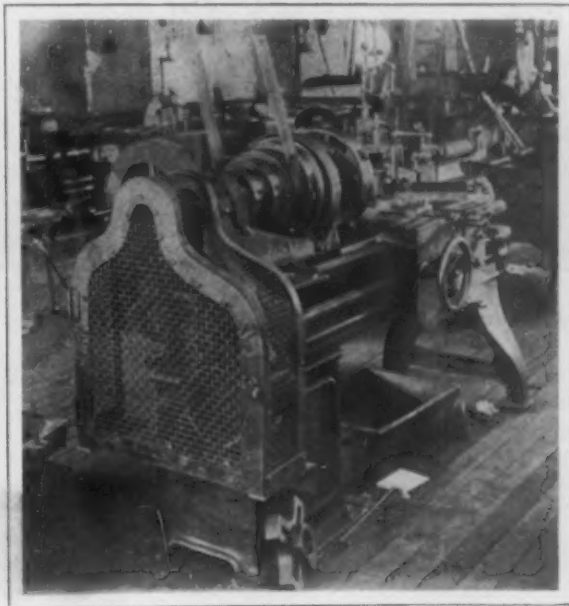
the Cincinnati Milling Machine Company, Cincinnati. Square sticks, in the opposite sides of which half round depressions have been sawn, are placed between the layers of shafts, thus insuring stability and safety. Another view is one taken in the plant of the Brown & Sharpe Mfg. Company, Providence, R. I., and illustrates a neat and effective way of guarding the intake side of a wet grinder belt. Unprotected belts on wet grinders have caused many serious accidents. The third view comes from the machine shop of



Safety Method of Piling Shafts



Wet Grinder with Provision to Guard the Belt on the Intake Side



Gears of Old Lathe Protected. Note Door to Permit Changing Gears.

inspector, these comments with suggestions for the betterment of conditions being afterward confirmed in a written report and transmitted to the head of the firm. Great interest is manifested by the heads of manufacturing establishments in these reports and nearly all of the recommendations are put into practice.

In addition to inspecting the plants of its

Deere & Co., Moline, Ill. The strong and substantial home-made guards, covering the gears of an engine lathe, are fairly typical of hundreds of others which the company has installed in different parts of the works.

Mention might also be made of a belt-shifting device developed by the R. K. LeBlond Machine Tool Company, Cincinnati (illustrated in *The Iron Age*, December 25, 1913).

*Safety Inspector, National Metal Trades Association.

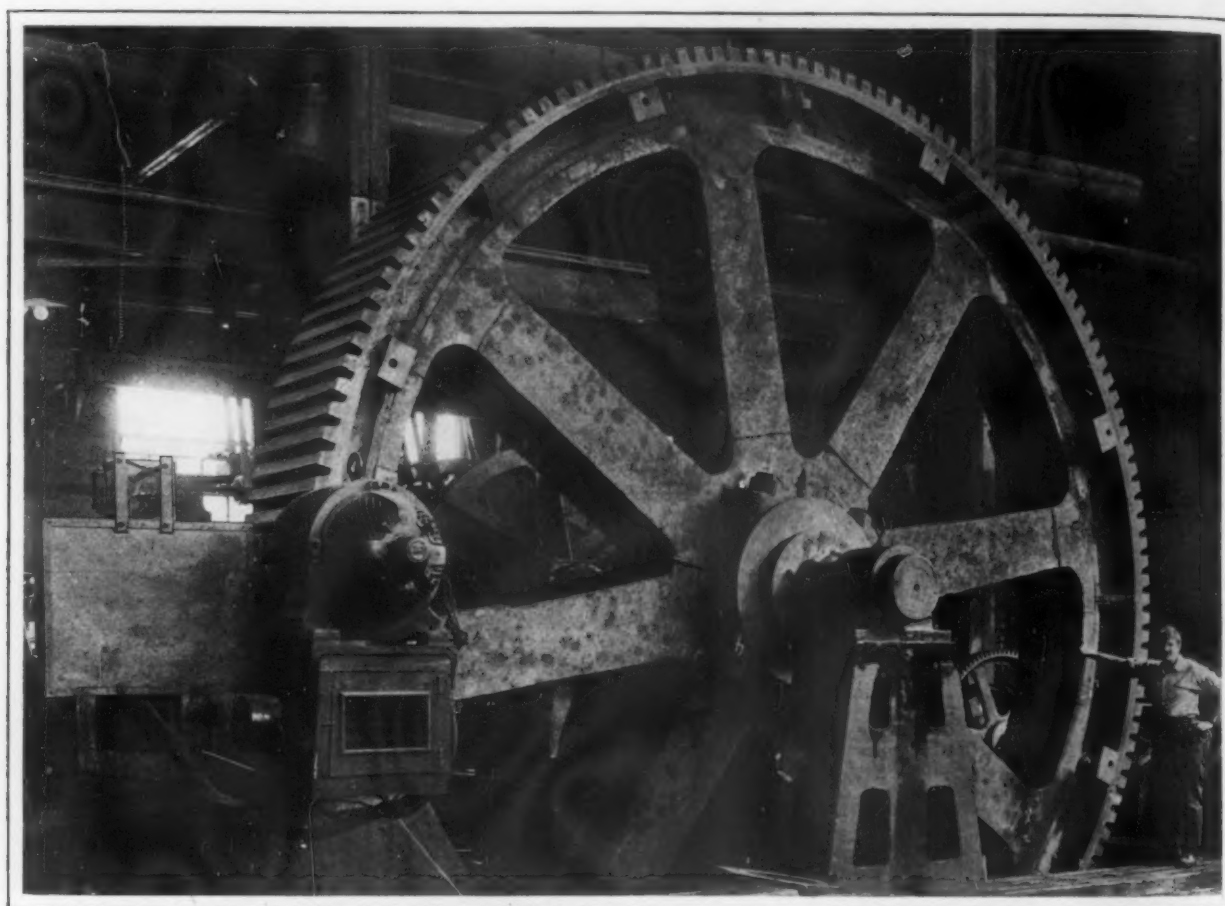
STAGGERED ROLLING MILL GEAR

A Gear 23 Ft. in Diameter with Three Rows of Teeth in Six Sections

What is probably the largest steel gear of its kind was recently shipped by the Mesta Machine Company from its works at West Homestead, Pa., to the Inland Steel Company at Chicago. This gear is different from ordinary practice, as the teeth are staggered in three sections. It will be used for driving a sheet mill, and it will be possible to obtain a single-stage speed reduction from the motor to the mill by using it. The number of teeth in the gear, which is almost 23 ft. in diameter, is 154, and there are 20 teeth in the pinion, which is 35 in. in diam-

machine was too yielding, and as a result this special machine was designed, in which the tool was driven directly by a heavy lead screw receiving its power from an adjustable-speed reversing electric motor.

After the rough casting had been annealed the joints at the hub and rim of the central portion of the gear were planed, after which they were drilled and reamed and the two halves bolted together. The next step was to place the wheel in the pit lathe, where the center was turned down to the correct diameter and the surfaces where the rim segments were to rest machined. The main gear was then removed from the lathe and the rim segments, which had lugs cast on them to aid in holding the work on the faceplate, machined. In this operation one segment was bolted to the faceplate and



View of the Gear in a Planing Machine Showing the Method of

Cutting the Teeth of All Three Sections Simultaneously

eter. The face width of the gear and pinion is 38 in. and the circular pitch is $5\frac{1}{2}$ in. The drive is subjected to axial motion, and for that reason it was decided to use a spur gear, herringbone gears not being considered because of the unequal pressures that would be exerted on the side of the tooth face. The speed at which the gears travel is 2000 ft. per min., and to meet this requirement the gears were carefully cut, the teeth staggered and the drive arranged to run in an oil bath.

The gear is composed of six parts, the central rim segments of the teeth being carried by the gear center, which includes the arms, etc. The two halves of the gear are bolted together and the separate rims fastened to this by bolts running through the side of the central casting.

The machining of the gear was an interesting operation. The gear teeth were cut on a specially designed planing machine which was built by the Mesta Company. It is stated that for large work it was found that the old style of crank-operated

turned up, after which it was reversed and the other side machined to size, and the segment turned to the correct diameter. The surface of the segment resting on the main gear was also machined at this time. The next step in the process was to bolt the rims securely to the main gear center with all the teeth in a straight line across the face. The teeth were next planed through the center and both side sections simultaneously, the final cut being taken on the gear without removing the tool during the entire cutting operation.

The mating pinion was machined in a similar way. When all the teeth were cut the bolts were taken out and the two side sections shifted in relation to the central one to give the proper amount of stagger. An indicating micrometer was used for doing this work with a view to eliminating any variation from the exact dimensions. After the teeth of the pinion were properly staggered those of the gear were set to match the pinion. A set of holes was then drilled through both rims and the

center of the gear, and after being reamed, machine bolts were inserted.

For shipping the gear it was separated into the various parts. It was pointed out that the installa-



A Large Triple Staggered Tooth Gear to Be Used for a Sheet Mill Drive at the Plant of the Inland Steel Company

tion of this gear will be a simple operation, as it is built up of six parts, all of which were fitted together at the plant with machine bolts before shipping. It is expected that it will not be necessary to disturb any of the machinery already installed in setting this gear in place.

December Increase in Idle Cars

In the half month ended January 1 the net surplus of freight cars in the United States and Canada increased from 101,545 to 188,850. The greatest increase was in coal cars, of which 72,535 were unused January 1, as against 36,435 on December 15. One year previous there was a net surplus of 17,058 cars as against a shortage December 15, 1912, of 34,382 cars. The average capacity of cars continues to increase and there is a heavier loading of available equipment. At the same time gross earnings confirm the substantial decline of traffic.

It is reported from Pueblo, Col., that the strike which has long been in progress at the plants of the Colorado Fuel & Iron Company is substantially broken. A much smaller working force can take care of demand now than was the case when the strike started. While it will be some time before the works reach their former efficiency, the results of the strike are satisfactory to the company from many standpoints.

Mat D. Griffith, Canton, Ohio, representing the Union Sheet & Tin Plate Company, and his chief engineer, C. H. Bryson, Youngstown, Ohio, have been investigating conditions at the company's plant at Marietta, Ohio, preparatory to beginning operations. It is stated that the plant is to be placed in operation as soon as it can be put in shape.

An Improved Upright Drilling Machine

The use of a gear box and a dial for regulating the feed changes is a feature of an improved design of positive feed vertical drilling machine brought out by the W. P. Davis Machine Company, Rochester, N. Y. There are three changes ranging from 0.007 to 0.017 in. per revolution of the spindle available, the rate in use at any particular time being clearly indicated on the dial. The back gears are thrown in and out of engagement by the movement of a single lever. The changes made in the new machine include the lengthening out of the spindle so that the driving slot is placed below the sleeve and the increasing of the diameter and face width of the driving cone pulleys. The diameters of the different steps on the cone pulley range from $4\frac{1}{8}$ to 9 in. and the face is $2\frac{3}{8}$ in. wide. The tight and loose pulleys are 10 in. in diameter with a 3-in.



A Recently Developed Vertical Drilling Machine Equipped with a Geared Feed

face, as compared with 8 and $2\frac{1}{2}$ in. respectively in the older type. The net weight of the machine is 720 lb.

Denton & Anderson, 1017 Engineers Building, Cleveland, Ohio, are successors to Denton & Flagg, continuing the business at Cleveland, Chicago and Detroit in the same offices. I. H. Denton is located at the Cleveland office; J. A. Anderson at the Detroit office; and C. E. Finley in charge of the Chicago office. They will be the direct representatives of the Ohio Seamless Tube Company, Cumberland Steel Company, Winfield Electric Welding Machine Company, and Dahlstrom Metallic Door Company in its automobile specialty department. The force of salesmen will be materially increased.

Owing to the new run-of-mine wage basis that is practically sure of adoption by the Ohio Legislature, coal miners and operators are predicting a suspension if not a strike in the spring. Large consumers are preparing to stock coal in anticipation of this.

The Rennerfelt Electric Steel Furnace

A Swedish Invention Differing from All Other Types—Details of Construction and Operation

A contribution by Axel Sahlin to the London Iron and Coal Trades Review for December 19, 1913, contains the following details of a new electric steel furnace, mention of which was made in *The Iron Age* of July 24, 1913:

In the year 1912 Ivar Rennerfelt, a Swedish engineer, constructed at Hallstahammer, Sweden, an electric furnace on a principle differing from all types previously in actual operation. The trial was so successful that, within a year, a steel foundry containing four Rennerfelt furnaces was constructed at Hallstahammer. During the period from April to November, 1913, seven furnaces have been put in operation, a number have been ordered

shell, rolling in cradles or tilted by revolving on a horizontal axle. It is lined with silica, carbon or magnesite brick, according to the work for which it is intended. A closely fitting charging and casting door is placed in one side or in each end of the furnace. The current is circulated by three electrodes, one central electrode descending vertically through the crown of the roof, flanked on either side by one horizontal, entering through the ends or sides of the furnace. These latter are adjustable longitudinally and also vertically. In ordinary practice the electrodes do not come in contact with the slag or bath. The arcs are free burning.

Three-phase current is passed into a transformer for Scott's method of phase transformation, changing the entering energy into balanced two-phase current, and delivering one-phase current to each of the horizontal electrodes. A return cable connects the common point of the two phases with the central electrode. The currents entering through the horizontal electrodes neutralize one another, but the action of the returning current into the central electrode generates a field of force which deflects the arcs downward toward the bath, thus forming them into an inverted arrow head or a fleur de lis, as shown in the cross sections, Fig. 2. This form of arc has hitherto been unknown in electric furnaces, and is one of the principal reasons for the success of the Rennerfelt furnace. The heat generated in the arcs is, to an exceptional extent, concentrated down upon the bath though the electrodes do not come in contact with either metal or slag.

The height of the arcs from

the points of the electrodes to the surface of the bath can be adjusted, but is usually kept at about 6 to 12 in. Smaller sizes of furnaces are tilted and discharged by hand-lever and ratchet movement, larger furnaces by electric or hydraulic mechanism.

OPERATION OF THE FURNACE

The Rennerfelt furnace is a large crucible, and can be charged with cold or liquid metal. If cold, the metal is charged by hand into the pre-heated furnace, together with the necessary fluxes. During the charging the electrodes are drawn back, so as to prevent their being injured. There is just enough activity in the bath after melting to form a neutral or reducing atmosphere in the furnace. One steel-melter and two laborers, or boys, per shift can manage a furnace melting from three to six tons of steel or more per 24 hr.

In the riveted steel shell is placed an insulating

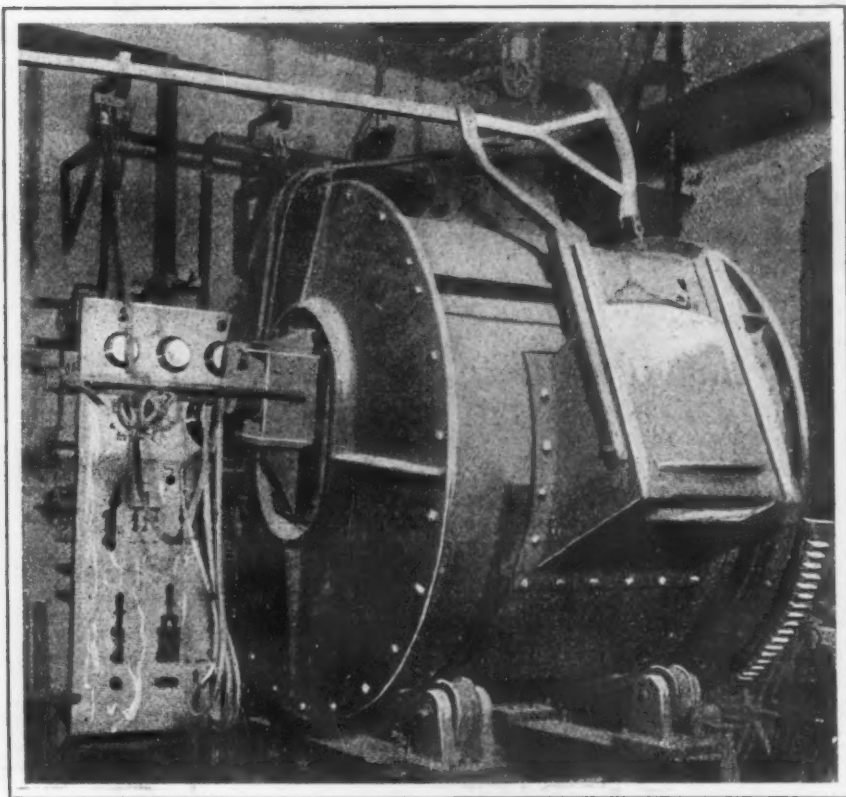


Fig. 1—A 25-cwt Rennerfelt Electric Furnace at Hallstahammer, Sweden

from Sweden, Norway and Russia, and repeat orders are being received. The furnace covers a field which has not yet been fully covered by any previous type, viz., an economical small furnace for crucible works, steel foundries, copper smelting, glass melting, also for melting ferromanganese, ferrosilicon and pig-iron alloys, and for chemical purposes. The furnace is owned by a Swedish company, the Aktiebolaget Elektriska Ugnar-System Rennerfelt. This company has its offices at No. 2, Fredsgatan, Stockholm. The general agency for Great Britain, Belgium, Germany, Austria and Hungary is in the hands of the International Engineering Company, successors to Julian Kennedy, Sahlin & Company, Limited, 52 Rue du Congrès, Brussels, and Prudential Buildings, Sheffield.

DESCRIPTION OF THE FURNACE

The Rennerfelt furnace, shown in Fig. 1, is preferably built with a horizontal cylindrical steel

lining of $\frac{1}{2}$ -in. asbestos board. Silica or first-quality firebricks in rings are built up against this, and form the bedding for the actual inner lining. This is made of silica, carbon or magnesite brick, set in rings of different diameters so as to form an egg-shaped interior melting chamber. It has not been possible to determine the life of the linings in the few months during which the furnaces have been in operation, but basic linings have run 110 heats without requiring repairs, and acid linings are in working order after more than 174 heats. The temperature is much higher in the basic furnaces. The circular form of the furnace is one of its greatest advantages. The radiating heat from the free-burning arcs is reflected on to the bath from the entire mirror-like incandescent inner surface of the vault. Yet the arcs are at such distance from this roof that the danger of melting the same is minimized. The shadow of the vertical electrode has a marked protecting influence on the vulnerable portion of the vault, the area around the entrance opening for the said electrode. There is no break between the roof, side walls and bottom, all being built together in one continuous curve. Owing to the comparatively small radius of the roof the arch is exceptionally strong, and the disadvantage of expansion and contraction of the lining is reduced. As the furnace is not only durable, but also small in comparison to its capacity, the cost of renewals of lining is low. To facilitate relining, the cylindrical shell is divided into an upper and a lower half, the two being bolted together when lined.

THE ELECTRODES

The electrodes are held with a loose fit in water-cooled, insulated phosphor-bronze boxes or holders, those for the horizontal electrodes being adjustable also in the vertical plane. They are turned to diameter specified, and made continuous by threaded sockets and dowels. For smaller furnaces the electrodes, which can be touched without shock, are fed by hand. For larger furnaces a hand-operated feeding mechanism has been added. For very large furnaces automatic feeding will be employed. The regulation is effected by gradually advancing or withdrawing the horizontal electrodes. The vertical electrode need but seldom be touched. Once the arcs are adjusted, it suffices to advance the side electrodes about 1 in. every hour. The consumption of Acheson electrodes per ton of steel is less than $6\frac{1}{2}$ lb.

REACTIONS AND RESULTS

Results depend upon the purpose for which the furnace is used. One Swedish firm employs an acid 12-cwt. Rennerfelt furnace for making the highest grade of electric crucible steel employed for cutlery, saw blades and tool steel. It requires 800 to 1000 kw.-hr. per ton of steel made. The current supplied is 100 kw. The stock, carefully selected, is charged cold. There is no boiling, only a slow circulation of the metal, permitting any small globules of slag which form to rise to the surface. The atmosphere in the melting room is slightly basic, and the formation of gas is just sufficient to prevent the oxidizing air from entering the furnace, which thus acts as a large crucible. As compared with the crucibles, the economy is marked.

A basic furnace of 12 cwt. capacity, with magnesite lining, is operating in a Swedish steel foundry producing special steel castings. The charge is made up of cast iron and steel scrap, ore and lime. There are only 90 to 100 kw. of current available, and the melting down requires about $1\frac{1}{2}$ hr. The duration of the heat is about $3\frac{3}{4}$ to 4 hr.

Owing to the high temperature maintained—some 2400 to 2500 deg. C.—sulphur and phosphorus are largely eliminated. With a working staff of four

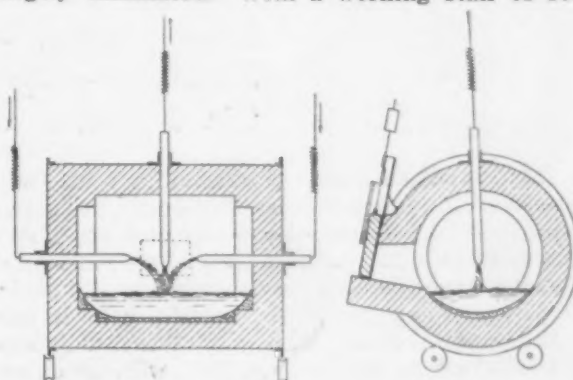


Fig. 2—Cross Sections of Rennerfelt Electric Furnace

men per shift, two furnaces will give an output of about 18 to 20 tons of steel per 24 hr.

Experiments are under way to ascertain the actual economy arrived at by the employment of carbon brick instead of magnesite.

COST OF MANUFACTURE

According to experience in Sweden, one kw.-year will produce:

	Tons.
In a small furnace—tool steel.....	8
In a small furnace—soft steel for castings.....	9
In a large furnace (estimated), refined liquid steel from Bessemer or open-hearth.....	40
In a small furnace, cast iron melted and refined.....	22

A basic Rennerfelt furnace of 12 cwt. capacity, producing 3 tons of soft steel per day, is producing liquid metal in the ladle at the following cost:

	Shillings per ton
1,025 kgs. scrap at 66s. per met. ton.....	67.65
Recarburizer and additions.....	3.10
Electrodes, 3 kw. (6.6 lbs.), at 1s. 3d. per kg.....	3.75
Labor.....	10.00
Repairs and renewals.....	5.00
Depreciation, 10 per cent.....	2.50
Royalty.....	4.00
Sundries.....	2.00
Total.....	98.00
One-ninth of a kw.-year at 36s.....	4.00
Total cost of metal.....	102.00

If kw.-year cost had been 72s., cost would have been	106.00
If kw.-year cost had been 144s., cost would have been	114.00
If kw.-year cost had been 288s., cost would have been	130.00

Though it is not yet a year since the first small Rennerfelt furnace was started, larger furnaces of up to 3 tons capacity are running and being constructed. The principle is applicable to small as well as large units, and the 30 to 50-ton Rennerfelt electric refining furnace for steel and iron is in sight.

The Norfolk & Western Railroad Company has awarded to the Virginia Bridge & Iron Company, Roanoke, Va., the contract for the construction of the supports to be used in that portion of the electrification of the railroad company's line between Bluefield and Vivian, in the Pocahontas coal field. The amount of the contract is \$100,000 and work will be begun within 60 days. The power station is being constructed at Bluestone Junction on the east side of the mountain and will supply the current to be used by the electric motors.

At the annual meeting of the Burt Mfg. Company, Akron, Ohio, held last week, reports showed a very satisfactory year's business in 1913 and bright prospects for 1914. Officers were elected as follows: President, W. F. Warden; first vice-president, H. F. Maranville; second vice-president, M. E. Knowles; general manager, J. Asa Palmer; secretary and assistant treasurer, J. Dwight Palmer; treasurer, F. E. Whittemore.

Two Modern German Steel Plants

Desulphurizing in a Mixer at the Julienhütte—The Baildonhütte Electric Furnaces and Their Operation

The Julienhütte steel works and the Baildonhütte electric steel works are in Upper Silesia and belong to the Oberschlesische Eisenindustrie, Actiengesellschaft für Bergbau und Hüttenbetrieb, at Gleiwitz. Considerable new work has been done in recent years, and this is described in detail in two recent issues of *Stahl und Eisen*. The new Julienhütte steel works was begun in 1905, with the object of using liquid pig iron directly in basic open-hearth furnaces, transferring the ingots to soaking pits, and rolling them into billets to be worked up in the other plants of the company. The design, construction, and arrangement of the plant are described in detail in the original paper. Practically everything is driven electrically, the power being derived from engines using the excess blast furnace and coke oven gas. The results obtained with the electrically driven billet mill were given in *The Iron Age*, July 31, 1913.

THE MIXER AS A DESULPHURIZER

The pig iron from the seven blast furnaces is brought to a 150-ton mixer, one of the first heated mixers built in Germany. It is fired with producer gas, and only the air is preheated. This mixer has two duties to perform, the first as a collector, and the second as a desulphurizer. Through frequent tilting, the metal is thoroughly mixed and a reaction between the manganese and sulphur with the formation of sulphide of manganese is brought about. The desulphurization is considerable as shown by the following analyses:

The pig iron from 26 blast furnace casts averaged sulphur, 0.097 per cent.; manganese, 1.97 per cent.; silicon, 1.26 per cent. The mixer iron from these same casts analyzed sulphur 0.066 per cent.; manganese, 1.94 per cent.; silicon, 1.16 per cent. The amount of metal put through the mixer is about 500 tons in 24 hours. The coal consumption averages 1.15 per cent., and the amount of slag is small amounting to 0.4 to 0.5 per cent. of the output of metal. The metal is also available for the recarburization of soft heats. The mixer is located at one end of the open-hearth building, which contains six stationary 45-ton furnaces, and a new electrically tilted 50 to 60-ton furnace. This latter furnace has a hearth 39 ft. 4 in. long, and 18 ft. 4 in. wide between the plates, the depth of bath being 27½ in. The Friedrich changeable dry port is used. The so-called pig-iron process is employed. The percentage of ore, mostly magnetite, is 15 to 18 per cent.; the scrap, mostly turnings, 25 to 35 per cent. The liquid pig iron is therefore from 65 to 75 per cent. of the charge, in some cases 80 per cent., depending

on market conditions. In this process the bath is covered with a slag which often foams for an hour because of the large amounts of carbon monoxide produced. Part of the slag is often drawn off at this stage of the process, especially when making the better quality steels, and utilized in the blast furnaces.

The total slag produced is about 20 per cent. of the weight of ingots. The ingots average 99 to 100 per cent. of the charge when working with 65 to 68 per cent. hot metal, due to the direct reduction of iron from the ore. The output of good ingots per furnace and day is 155 to 160 metric tons. The new tilting furnace gives about 190 tons per furnace and day. The average number of heats in the 24 hours is 3.5 to 4.0. Of the steel produced 90 to 95 per cent. is from 0.08 to 0.15 per cent. carbon, and the monthly output with 130 to 145 furnace days is from 21,000 to 23,000 metric tons.

The coal consumption in the soaking pits is only 2.3 per cent. and the loss of steel by heating is about 1.75 per cent. The ingots average 4 to 4½ tons, and are charged at from 800 to 900 deg. C. and

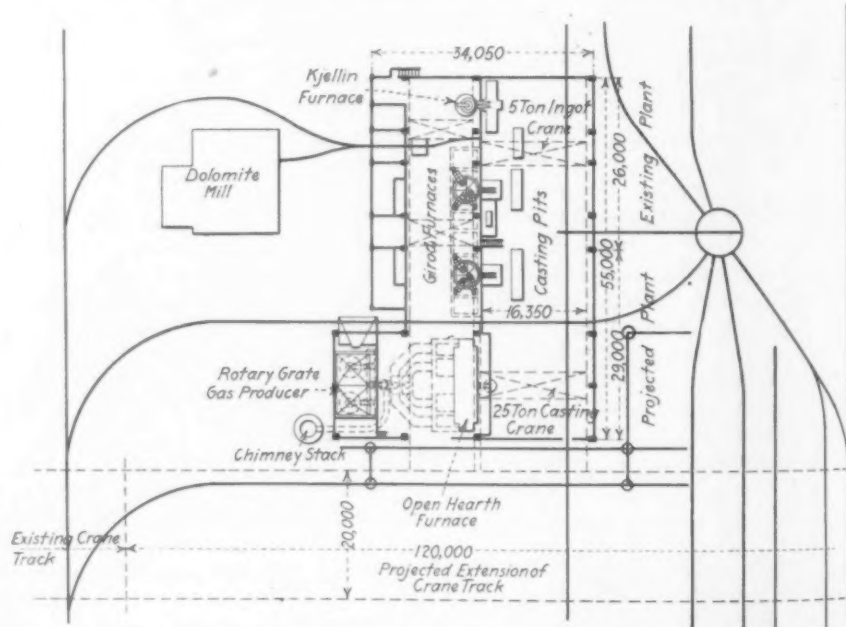


Fig. 1—Plan of the Baildonhütte Electric Steel Plant

drawn at 1150 to 1200 deg C. As mentioned before, the billet mill is electrically driven, and the following table gives an idea of its operating results:

Month,	Ingots rolled, metric tons	Average size of billet	Main mill drive, kw-hrs.	Minor mill drive, kw-hrs.
1913				
April	21,383	5.61 in. sq.	29.6	5.78
May	18,046	5.96 in. sq.	27.31	5.12
June	20,272	6.14 in. sq.	25.28	4.47

Included in the minor mill drive (for live rollers, etc.) is 0.50 kw. hours for lighting.

THE ELECTRIC STEEL PLANT

The plant of the Baildonhütte electric steel works is interesting because the entire construction is of reinforced concrete, and it is believed to be the first example of this construction being used throughout

for a steel works building. The plan and elevation are shown in Fig. 1 and Fig. 2. At present only the Kjellin and one Girod furnace are installed, and only enough of the building has been done to care for these two furnaces. It is intended to enlarge the building as shown in Fig. 1 and build a second 8-ton Girod furnace, together with a 15-ton open-hearth furnace. A Kjellin furnace was installed at the Baildonhütte as far back as 1907 to make tool steels and alloy steels high in nickel and tungsten, the latter of course for high-speed tool steels, to directly compete with crucible steel. This it did with entire satisfaction. This first furnace was transferred to the new plant. The charge is about $1\frac{1}{2}$ tons, the current consumption varies with the melting point and the electric resistance of the steel from 700 to 950 kw-hr. per metric ton. The melting loss is negligible apart from a slight decrease in carbon almost exactly proportional to the time of the heat. On this account the most complex analyses can be produced more easily and certainly than in the crucible.

The uniformity of the heats is shown in the original paper by a table of analyses. Three men and a crane operator handle the furnace, the latter also attending to the Girod furnace, the weighing and charging of the material, the pit work, transferring of the ingots, etc., is all done by these men. The hearth lining of burned dolomite and tar lasts for 20 to 25 shifts, corresponding to an output of 50 to 60 tons of steel. A notable advantage of this furnace is the readiness and thoroughness with which additions to the bath are taken up. Due to the peculiar whirling motion of the bath, ferromanganese or other alloys are uniformly distributed in a few seconds. No refining is attempted, the furnace being considered as a "crucible" and it fulfills its task, of melting and alloying, in the most satisfactory way.

OPERATION OF THE GIROD FURNACE

Where larger amounts of steel are desired, refined to the extreme degree of purity, the electric arc furnace is used, as it allows the production of hot slags capable of exerting either an oxidizing or reducing action. For this purpose an 8-ton Girod furnace was chosen, using three phase alternating current. No rotary transformer is necessary, and the installation cost is reduced to a minimum. It has been in operation for several months, and so far appears to fully answer expectations. At present it works with cold charges, producing chiefly carbon steels, as well as low percentage alloy steels for tools and structural work. The quality leaves nothing to be desired. The current consumption varies from 750 to 900 kw-hr. per metric ton, depending on the degree of refining and the hardness of the steel. The time per heat is six to seven hours excluding that required for charging. The electrode consumption has already been reduced to about 26 to 31 lb. per ton. The hearth stands up very well, the present one having been in use for six weeks without giving any trouble.

DISPLACING CRUCIBLE WITH ELECTRIC STEEL

Through the installation of this furnace the output of steels of the highest quality has been greatly raised. It is known that the Kjellin gives steels fully equal to crucible; indeed, in regard to uniformity, even superior. Experiments in producing equally good steels in the Girod furnace have also been successful. Extensive tests have been made as to the hardness, forgeability, and general working qualities of these tool steels in the new and

well-equipped machine shops of the Baildonhütte. They have shown that the question of the quality

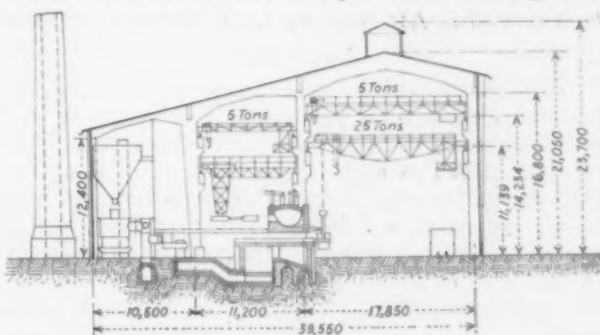


Fig. 2—Section in Elevation of Concrete Building for Electric Steel Plant

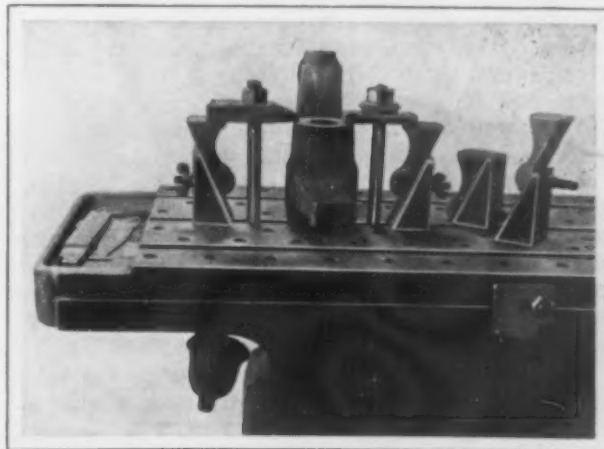
of electric steel, when suitable material is used in the charge, must be considered as solved.

Apart from that used for heating the buildings, no steam is used in the plant. Even the hammer used for forging the sample tests is electrically driven. This allows the plant to be kept extremely clean, which is an advantage in making high-grade steels. The other departments of the Baildonhütte have been brought up to date in order to properly handle the steels produced. It is believed that all the needs of Upper Silesia, which is unfavorably situated in regard to freight rates, will be more than met by this new plant, and that products can be offered in not only the German markets but in those of the world.

G. B. W.

An Adjustable Strap Support for Blocking

For use on planing, shaping, milling and vertical drilling machines, the Henry Perkins Company, Bridgewater, Mass., has brought out the Keith strap support. This device is intended primarily for use as a support to hold one end of a strap in fastening work to the machine table. As indicated in the accompanying illustration, the device consists of two approximate triangular shapes arranged so that the hypotenuse of each bears against the corresponding edge of the other. The lower portion has a central slot extending for almost its entire height in which a thumb screw slides. This is fastened at the other end to the inverted triangular portion of the device and provides a fine adjustment to give the exact height desired. The device can also be used for blocking up the corners of work on a machine, blocking out from an angle plate or in any place where a jack or block of wood or iron wedge is frequently



An Adjustable Type of Strap Support or Blocking for Use on the Tables of Planing, Shaping and Drilling Machines

used. The supports are made of gray-iron castings and the three sizes now on the market cover a range from 2 to 17 in.

DEPARTURE IN FOUNDRY WORK

A Successful Attempt to Cast Linings of Steel Castings

For many years steel foundrymen have attempted to cast their product in iron molds as this would do away with the difficulty of securing a refractory material able to stand the high temperature of molten steel. In instances where castings were very small a limited amount of success has been attained, but wherever the amount of metal to be cast was large or the section heavy, failure has uniformly resulted from such attempts to use iron molds.

Another question which steel foundrymen have tried to solve for years has been that of "burning-

great deal of sharp sand and each section had no less than half a dozen large holes through which the water gushed in such quantities, when the pump was in action, as to make its operation unprofitable to the dredging company. These casings were lined with a hard steel lining cast into them and welded throughout to the old material by the Columbia Steel Company at its plant at Pittsburg, California. The analysis of this steel lining was approximately as follows:

	Per cent.
Carbon	0.35
Sulphur	0.020
Phosphorus	0.004
Manganese	0.75
Silicon	0.35

It will be seen that the sulphur and phosphorus content of this steel is exceptionally low and that the continuity of the cast lining was one that could

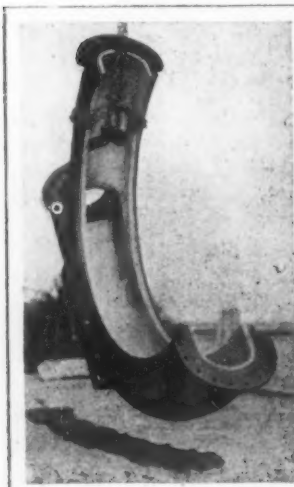


Fig. 1—Lower Half of Pump Casing Weighing 2900 lb.

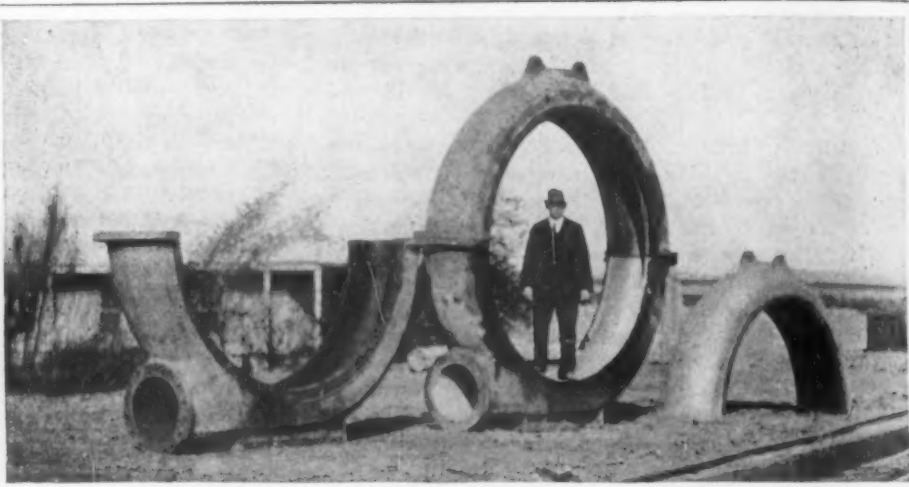


Fig. 2—Separate and Assembled Casings for a Twenty-inch Suction Pump, Weight 5600 lb.

on" such parts of castings as might have been cut off by the sand dropped from the cope or from misplaced cores, as frequently happens in gray-iron foundry work. Owing to the very high temperature of steel incorporated in steel castings success has not attended the efforts to do this, as the "welds" were never perfect owing to the fact that the material of the old casting did not reach as high a temperature as the material being poured in and the result was that when the casting cooled off the weld pulled loose either in whole or in part.

It has long been known in steel foundry practice that two things which cause checking in steel castings are sulphur and phosphorus. As a consequence it has been unreasonable to expect success from efforts made to cast linings in other castings or to weld on pieces to broken or defective castings in steel foundry work by the ordinary casting or burning-on process. It is only within the last few months that a steel has been commercially cast in sand molds which was sufficiently low in phosphorus and sulphur to obviate checks. In the electric furnace, the manufacture of this material has been possible for some two or three years, but the cost of production has been high and therefore militated against its use.

In order to be able to do successfully the work shown in the accompanying illustrations, it is necessary that such low phosphorus and sulphur steel should be used. Fig. 1 shows the lower half of a 20-in. pump casing and Fig. 2 the assembled halves, the upper and lower casings, made of open-hearth steel, which is the material usually used for this purpose. These casings had been worn out in a few months in handling water which contained a

not be obtained in ordinary steel foundry practice, to say nothing of the fact that this lining was welded to the casing in which it was cast. It is interesting to know that, after this operation was completed and the two sections of the casing put together, there was less than 3/32-in. discrepancy between their dimensions then and when originally installed in the dredge.

S. S. K.

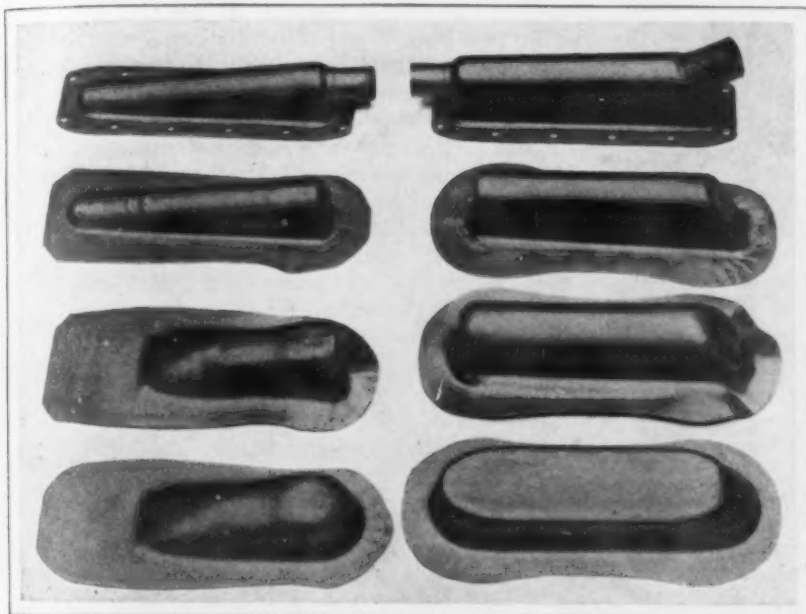
A Difficult Sheet Metal Stamping

Among the various sheet metal stampings used in the construction of an automobile, one of the most difficult to make is the water outlet header that goes across the top of the cylinder to collect the jacket water. The complete part consists of a front and a rear header, both of which are quite similar in general appearance. When installed a short section of a rubber hose connects the larger header in the front with the smaller one in the rear and another section of rubber hose extends from the front section to the radiator. Cast-iron headers are generally used, but recently a few automobile makers have adopted one made from drawn steel, believing that sheet metal possesses various advantages over castings for this part, as the stamped header is lighter, does not require machining or fitting up and has no plugged up blow holes that are found in some castings and that are likely to cause trouble.

The header shown in the accompanying illustration, which includes views of the stamping after some of the operations, is being made by the Acklin Stamping Company, Toledo, Ohio. It is drawn from 1/16-in. steel. The larger piece requires 10 opera-

tions exclusive of brazing and welding, and the smaller takes eight operations. In this irregular drawn work only the standard types of dies are used. Considerable difficulty was met in making the dies work in relation to each other and in gathering up the stock in the drawing operation so there would not be too much or too little metal. This latter difficulty was overcome by starting with dies having rather sharp corners and by rounding these corners off until it was found that the right amount of stock was gathered up.

The two parts are drawn from pear shaped blanks, one about 7 x 13 in. and the other 8 x 15 in.



Views Showing the Different Steps in the Manufacture of a Drawn Steel Water Outlet Header for an Automobile

After blanking three drawing operations are required for forming the parts into the required shape. The left section of the illustration shows the larger part after each of the three drawing operations and the completed header. The right part of the photograph is a similar view of the drawing of the smaller header and the completed part. After the parts are formed the operations in their order are trimming, piercing small holes in the flange and punching and flanging holes at both ends of the larger part and at one end of the smaller part for attaching the short tubes for making the hose connection. This piercing and flanging is done on a horn instead of on an ordinary plate, and owing to the location of these flanges a rather complicated die is necessary. The pieces of tubing are inserted on a bench fixture having a lever that forces the tube in place. The anvil on this assembling fixture is removable so that a different one can be used for the various angles at which the tube is inserted. After being inserted the tube is brazed in place. To the flange at the bottom of the header another flange is spot welded. This is made of extremely hard stock and is added so that the part will not become bent in handling before being assembled in an automobile.

After the parts are completed they are tested for water leakage at the brazed joints, underneath the

flange and between the flange and header proper, this test being made on a special tester, which provides for a duplication of actual working condition. The test is made by plugging up the tube openings and subjecting the header to a water pressure of 25 lb.

Vertical-Spindle Cold Sawing Machine

A cold metal sawing machine has been brought out by the Newton Machine Tool Works, Inc., Philadelphia, Pa., for cutting off risers from relatively flat circular castings, such as engine driving wheels,

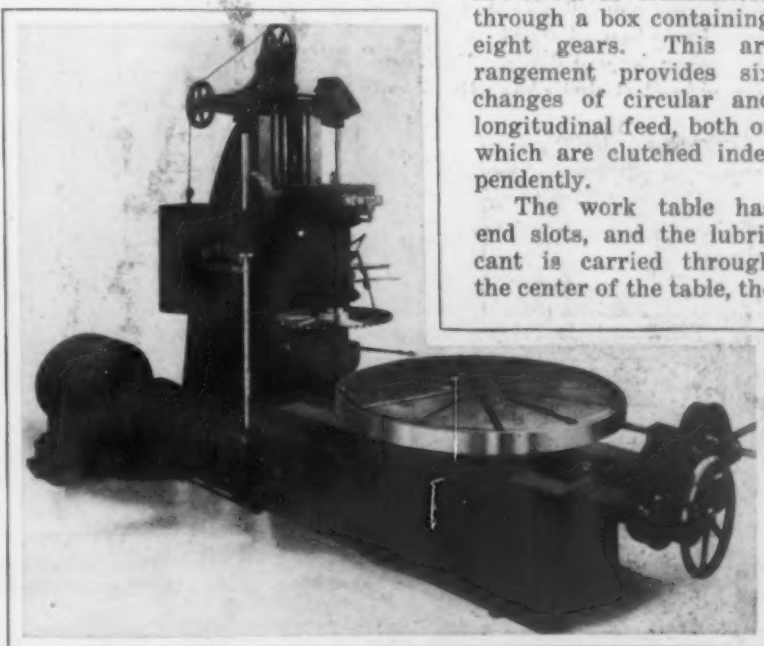
large spur gears, propeller blades, etc. The casting is placed upon the table and bolted fast, and reclamping the casting for almost every head is not, as formerly, necessary. The machine has a vertical spindle with a blade in the horizontal position, and one has already been furnished to the Government for operating chiefly on the mountings for rapid fire guns. These castings have a large number of sink heads or risers, and it is estimated that a saving of at least 20 hours out of the 25 formerly required for this particular job will be effected.

The machine is driven by a 10-hp. semi-enclosed General Electric motor operating at a speed of from 600 to 1200 r.p.m. From the motor motion for the drive and all the movements is transmitted through spur and bevel gears to the vertical driving splined shaft and also

through a double train of bevel gears engaged by a friction clutch controlling the feed and fast power motion. On the opposite side of the machine the

motion is transmitted through a box containing eight gears. This arrangement provides six changes of circular and longitudinal feed, both of which are clutched independently.

The work table has end slots, and the lubricant is carried through the center of the table, the



A Cold Metal Sawing Machine for Cutting Off Risers from Castings. The Special Feature of This Machine Is the Use of a Horizontal Blade

saddle and the base to a reservoir in the last. From here a gear pump is used to redistribute it. Reversing fast power traverse and reversing longitudinal fast power traverse are provided for the table in

addition to the geared feeds and a hand control. An in-and-out adjustment for the table sufficient to swing pieces 72 in. in diameter in front of a 30-in. blade is provided.

The following table gives the principal dimensions and specifications of the machine:

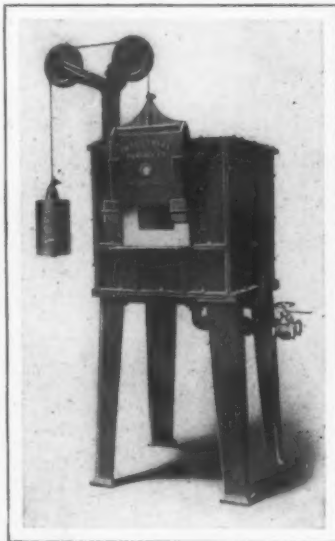
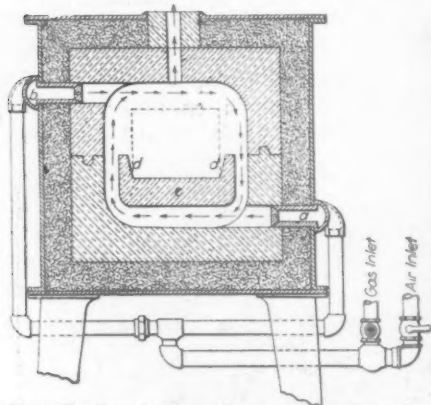
Capacity for round stock, in.	8 1/2
Over-all diameter of circular table, in.	60
Minimum distance between blade and table, in.	1
Maximum distance between blade and table, in.	24
Distance from spindle center to frame, in.	15
Floor space occupied, ft.	5 x 12
Complete weight, lb.	20,000

In a preliminary test of the machine made on the company's erecting floor, without foundations, with the machine taking a cut on a piece of 0.35 per cent. carbon stock 5 in. in diameter, the motor required from 24 to 36 amperes at 228 volts. With the machine running light only 6 amperes was required. It was found as a result of this test that the blade which was of a new Taylor-Newbold inserted-tooth design, 30 in. in diameter, rotated more smoothly than the company's standard horizontal spindle type. In making this test the machine cut at the rate of 2 1/2 in. per minute, as compared with a feed of from 5/8 to 3/4 in. per minute, which is the average rate in steel foundries at the present time.

A New Gas Heat Treating Furnace

A new line of gas furnaces for the heat treatment of high speed steel has been brought out by the Industrial Furnace Company, 671 Atwater street, Detroit, Mich. These furnaces have greater burner capacity than the company's furnaces for ordinary tool steel and very heavy linings to resist the intense heat and to allow the reaching of high temperatures in the shortest possible time. The furnace shown in the accompanying illustration is designed for hardening milling cutters, dies and other tools that must be laid on a flat surface while being heat treated. The fire brick lining is 3 in. thick and outside of this is a 2 1/2-in. asbestos lining.

Two sets of burners are provided, one set, *a*, on the side that fires from beneath the hearth and the other burners *b* on the opposite side that fire along the dome. By this arrangement the hearth *c* is



Two Sectional Elevations and an Exterior View of One of a New Line of Furnaces for the Heat Treatment of High Speed Steel. Gas Is the Fuel Employed

enveloped in a rotating flame, which gives an even heat and there is claimed to be a perfect combustion of fuel. The edges of the hearth are protected by ledges *dd* so that none of the flame comes in contact with the steel. The construction is such that the furnace heats up quickly and cools off slowly. It is stated that the two smaller sizes will heat up to 2200 deg. F. in 15 min. and the larger sizes in 30 min.

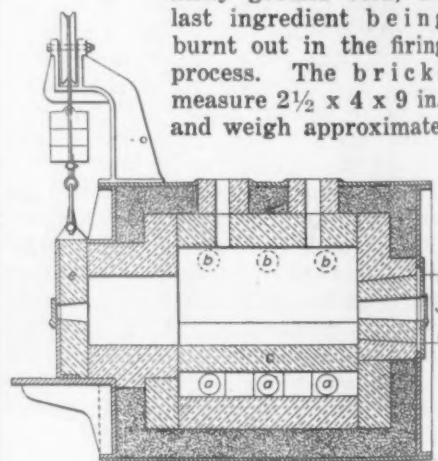
There is one inlet and a single control valve both for gas and air, this inlet ranging from 1 1/4 to 1 1/2 in. in diameter according to the size of the furnace.

No sheet metal is used in the construction of the furnace. The outer walls are cast-iron plates firmly bolted together. The front is cast in sections, provision being made for contraction and expansion, so that the danger of cracking is practically eliminated. The door *e* is counterweighted so that it may be held open at any point. When lowered it is wedged tightly against the front of the furnace. The heating chamber ranges from 10 to 30 in. in depth and 6 to 16 in. in width, and the door opening from 5 x 6 in. to 10 x 16 in. in size. A firebrick plug *f* can be removed to replace the hearth. An opening in this plug is provided for the insertion of a pyrometer and there is a sight hole in the door.

Another furnace is being made of similar construction, but with a cylindrical heating chamber and case. It stands on a cast-iron pedestal instead of legs, this being especially designed for hardening drills and reamers. This type has sliding doors that when closed leave a circular opening 1 1/2 in. in diameter in the center, through which tools may be placed in the heating space. If a larger opening is desired it can be secured by sliding the doors apart slightly. This furnace has a heating chamber 7 in. in diameter and 10 in. deep. Tools placed through the opening of the door are in the center of the rotating flame. For small flat pieces a hearth may be placed in the heating chamber.

An Insulating Brick for Furnaces

For use in boiler settings, furnaces, breechings, stacks, kilns, bake ovens, stills, etc., the Armstrong Cork Company, Pittsburgh, Pa., has brought out an insulating brick. This brick, which is said to combine low heat conductivity with sufficient mechanical strength to enable it to be built in as a part of the structure itself, is composed of a mixture of infusorial earth, a small amount of clay and finely ground cork, the last ingredient being burnt out in the firing process. The bricks measure 2 1/2 x 4 x 9 in., and weigh approximate-



ly 1 1/2 lb. apiece. In installing the bricks, either between the inside firebrick and the outside common brick, or on the outer side of the common brick with a coat of cement plaster on the outside, a special insulating cement is used. This is composed of practically the same substances as the bricks themselves and has substantially the same insulating value.

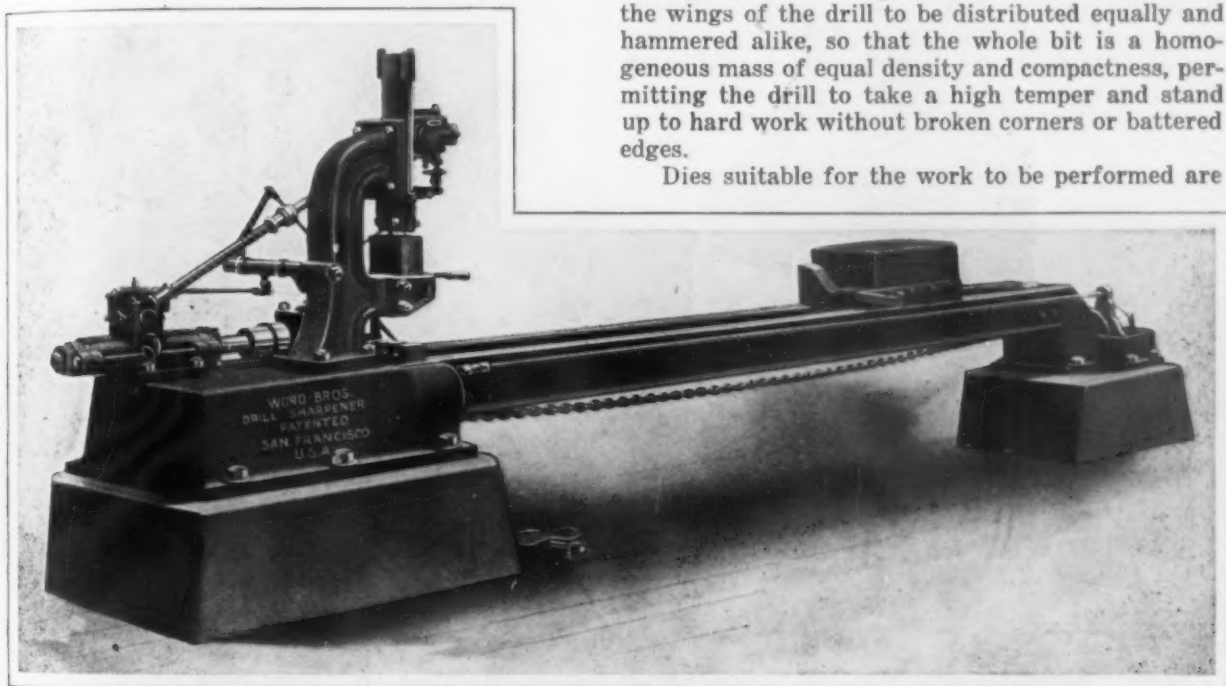
Drill Making and Sharpening Machine

An improved machine for making and sharpening drills has been placed on the market by Word Bros., San Francisco, Cal. The machine consists of a cast-iron bedplate with two power hammers, a vertical and a horizontal one, mounted upon it, and a dead block carried by guide rods which are attached to the bedplate. The machine weighs 4000 lb. and has a capacity of from 700 to 800 drills per day.

The hammers are actuated by compressed air and are equipped with automatic controlling valves, thus enabling the operator to handle both hammers by a single foot treadle, which is pivoted under the hollow of his foot. This arrangement, it is pointed out, permits him to operate the machine without moving his foot from one place. Applying pressure to the toe of the treadle brings the horizontal ham-

mer into action, which is moved by a screw that in turn is driven by a friction gear operating at a speed of 600 r.p.m. The application of the pressure to a lever is relied upon to adjust the dead block for different lengths of drills. Between the hammer and the dead block are located adjustable split dollies which work upon the cutting edges of the drill and forge and sharpen all sizes of drills without any change. The horizontal hammer strikes these dollies rapidly and causes them to be driven against the drill bit, from which they rebound slightly at every blow. When they are being struck, the dollies are opened and closed by a cam lever attached to the guides carrying them. This opening and closing of the dollies while they are working on a drill or a blank piece of steel, it is pointed out, prevents buckling or bending of the steel, as they work only upon two wings of the bit, bracing and supporting the portions being worked on. This arrangement, it is emphasized, causes the metal in the wings of the drill to be distributed equally and hammered alike, so that the whole bit is a homogeneous mass of equal density and compactness, permitting the drill to take a high temper and stand up to hard work without broken corners or battered edges.

Dies suitable for the work to be performed are



A Machine for Making and Sharpening the Bits Used in Rock Drilling Work

mer into action, the intensity and speed of the blows being governed by the amount of pressure. When the pressure is released from the toe of the treadle the hammer is stopped by the controlling valve, which shuts off the supply of air to the hammer and brings the piston to a retracted position and the treadle to a neutral one. Depressing the heel of the treadle starts the vertical hammer, which is stopped in the same way as the horizontal one.

It is pointed out that the controlling valves always bring the foot treadle to the neutral position when the pressure of the operator's foot is removed or rests equally upon each end of the treadle, the pistons of the hammers which carry the dies or hammer heads being brought to the upward or backward stroke and held there. This control arrangement is relied upon to prevent one hammer from coming into action while the other is in use, and it is stated that the amount of time required to stop one hammer and start the other under a full air pressure is only 1/10 sec.

The dead block, which is a casting faced with tool steel, is located in line with and moves toward and away from the horizontal hammer. The drill bits or steels rest upon this block, which receives the impact of the horizontal hammer when it is in action. Guide rods bolted to the bedplate support

carried on the vertical hammer and, like the dollies, do not have to be changed in handling different sizes of drills. The function of the horizontal hammer is to swage and gauge the drill bits and to shape the wings of a new drill properly.

A new size of power hack saw machine has been brought out by the Armstrong-Blum Mfg. Company, 339 North Francisco avenue, Chicago. In tests, 6-in. round cold steel has been cut in 10 min. and 5-in. stock in 2 min. less. The machine has an arrangement for fastening the blade so that it can be tilted either to the right or left at either end, and an adjustment of the cutting feed so that any desired pressure on the blade can be obtained.

The business of the Bergen Construction Company, Brooklyn, N. Y., engineer and constructor for structural and ornamental iron works, has been purchased by the Brooklyn Structural Steel Corporation, which will continue the business at the same location and carry out all contracts entered by the company taken over.

A. Tennant Sons & Co., 100 William street, New York, announce that they have been appointed sole selling agents in the United States for European makers of electrolytic ferrosilicon, which runs 50 and 75 per cent.

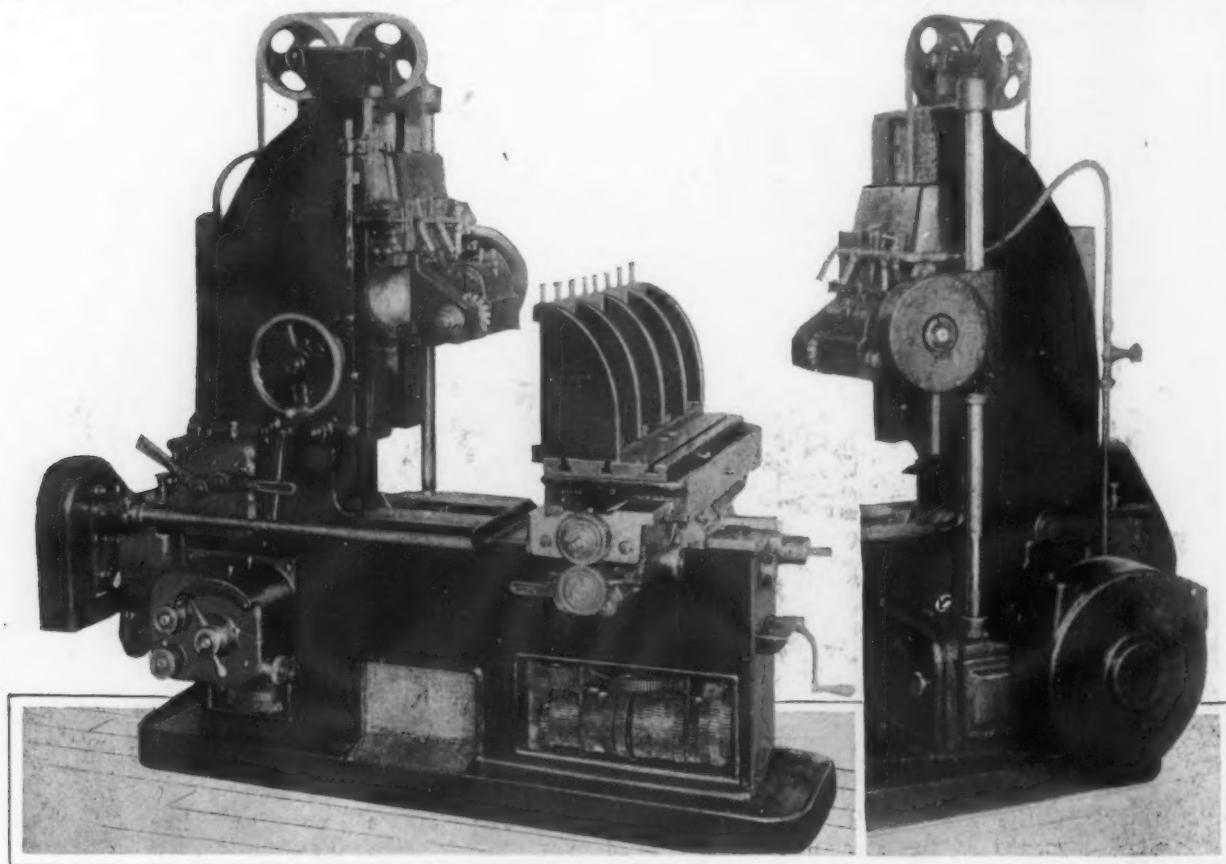
A New Automatic Rack Cutting Machine

For handling a medium class of rack cutting work, Gould & Eberhardt, Newark, N. J., have equipped their 12 x 36 in. vertical gear cutting machine with an attachment which converts it into an automatic machine tool for cutting racks. Among the special features of the machine are the use of the vertical cutting principle and automatic indexing of the work table and the cutters. If desired, the machine can be furnished with an indexing table for cutting either spur gears or spur and bevel gears, this arrangement being intended particularly for plants that have not enough rack cutting to keep a machine of this type constantly at work. It is emphasized that only a short space of time is required to change the machine from one for cutting

be employed and the machine will index automatically for the number of cutters being used at one time. The machine is belt driven by a single belt and the driving pulley is inclosed by a guard and all the running gears are covered.

The machine will cut racks up to 36 in. long with a 10-in. face at one setting, the maximum diametral pitch available being three in cast iron and four in steel. A larger machine of the same general design is being developed, which will cut racks up to a maximum length of 72 in. and a face width of 12 in. or gears having a maximum diameter of 60 in., with a 16-in. face. The capacity of this machine is $1\frac{1}{2}$ diametral pitch in cast iron and 2 in steel.

In the accompanying engraving, the machine is illustrated with a chuck mounted on the table. This is not furnished regularly, but serves to show how



Front View and a Partial Rear View of a Vertical Automatic Gear Cutting Machine Arranged with an Automatic Rack Cutting Attachment

racks to a gear cutting machine or vice versa, so that it should have a large field of usefulness in manufacturing and gear jobbing plants.

It is pointed out that the use of the vertical cutting principle enables a powerful cutter spindle drive to be secured without a long overhanging arm or head, the chips and cutting compound clearing themselves and dropping into the base of the machine. The cutting strains are absorbed in the base. The indexing of the work table is accomplished automatically and while this is being done the cutter slide is locked to prevent it from feeding down until the operation is completed. A micrometer adjustment is provided for the work table indexing screw, so that it is possible to move the table and the rack being cut a slight amount without disturbing the change gears. One of the advantages pointed out for this arrangement is that it is possible to cut racks which are longer than the rated capacity of the machine, or to cut sections of racks that are to be matched together to form a long piece. The changes in the feed are quickly secured by a compact feed gear box. Single or gang cutters can

several racks can be mounted, one on top of the other.

The United Steel Company, Canton, Ohio, will shortly place contracts for plant extensions, which will include the installation of a combination mill, comprising an 8-in. and a 9-in. merchant bar mill. The mill, which will be electrically driven, will be placed in a new building to be erected adjoining the present merchant bar mill building, in which are housed a 20-in. and a 10-in. bar mill. Two continuous heating furnaces will be provided for the combination mill. Other equipment to be purchased in connection with the new mill will be the necessary cooling beds, tables, shears, coilers and other equipment. The company plans to have the new mill in operation about July 1.

The Craftsman Tool Company, Conneaut, Ohio, recently incorporated with a capital stock of \$30,000, has purchased at trustees' sale the property of the Attwood Machine Company in that city and plans to place the factory in operation shortly and to add to the line of tools made by the Attwood Company the manufacture of other products.

A Double-Plunger Hydraulic Pump

For use in connection with hydraulic presses, where a pressure of from 5 to 100 tons is required, the Defiance Machine Works, Defiance, Ohio, has



A Double-Plunger Hydraulic Pump for Supplying Pressures of from 5 to 100 Tons

brought out a double-plunger pump. The controlling valve is located in a convenient position for the operator and a safety valve is provided to guard against overstraining the parts.

The plungers, which are of hardened and ground tool steel, $1\frac{1}{8}$ in. in diameter, can exert a pressure of 2700 lb. per sq. in., the length of the stroke being 2 in., which gives a discharge of 1200 cu. in. per min. A crank or eccentric shaft in connection with the cross-head operating in forged steel slides and bronze wrist pin boxes actuates the plunger. The crankshaft is 2 in. in diameter and runs in babbitted bearings 6 in. long. A friction driving pulley 26 in. in diameter with a 6-in. face is fitted to the crankshaft and is intended to run at a speed of 250 r.p.m. A conveniently located hand lever operates the friction and it is emphasized that this arrangement is very effective owing to the small amount of movement required to start the pump. Access to the check valves, which, it is emphasized, are sensitive and reliable in action, is secured by simply unscrewing the bonnet. After this has been done it is possible to lift the valve out and the seat can be removed readily by employing a special socket wrench.

The controlling valves are similar to those employed by the builder on its other pumps. The location of the valve, it is pointed out, is such as to bring the controlling lever in a convenient position for the operator. It is possible to maintain the pressure on the ram or to return the fluid to the reservoir instantly by swinging the controlling lever through an arc of 180 deg. A safety valve which can be adjusted to release the pressure at any predetermined point is relied upon to act as a safeguard and prevent straining of the parts with the consequent likelihood of breakage due to careless operation. If desired, either a pressure gauge, indicating the amount of pressure applied to the ram in tons, or one showing both pounds per square inch and tons on the ram, can be supplied.

For driving the pump a $7\frac{1}{2}$ -hp. electric motor is used, or if desired it can be driven from an overhead countershaft, the power required in this case

being approximately 5 hp. If the belt drive from the countershaft is used, a countershaft $1\frac{15}{16}$ in. in diameter and 48 in. long is furnished, together with driving and tight and loose pulleys 12 in. in diameter, with a 6-in. face. The speed of the countershaft should be 550 r.p.m. The floor space occupied by the pump is 36 x 40 in., and the domestic shipping weight is 1475 lb.

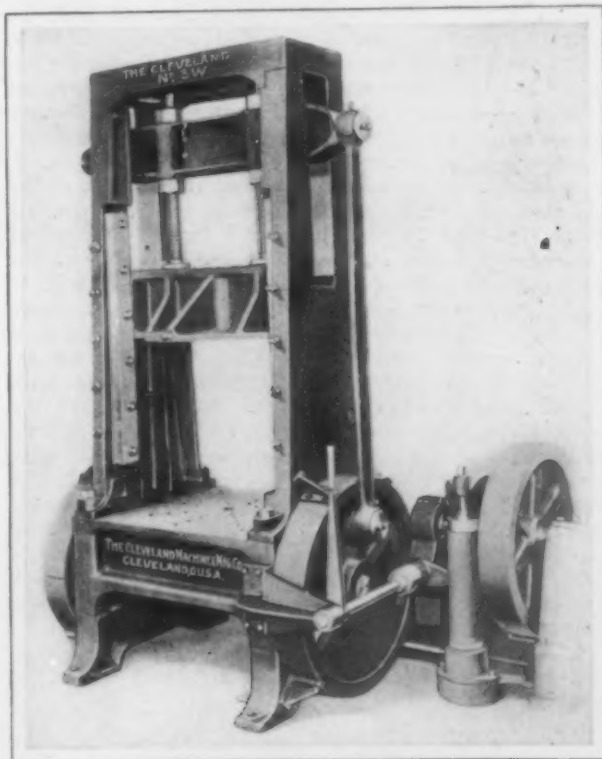
Long Stroke Wiring and Forming Press

The Cleveland Machine & Mfg. Company, Cleveland, Ohio, has developed a long stroke forming and wiring press. It is designed for the deep forming of light sheet metal parts and for wiring the edges of ash cans, wash tubs, water pails, etc.

As will be noted from the accompanying illustration the uprights or housings are made deep and heavily ribbed to give a rigid frame and a proper arrangement of gibs. There are cored pockets in the housings into which lugs on the back of the gibs fit to take the pressure of the adjusting screws. This construction is also relied on to give a good bearing for the slide and at the same time enable it to be removed from the machine without taking down the housings.

The machine is double geared with a ratio of 10 to 1 and is belt driven by a flywheel 30 in. in diameter with a 5-in. face that acts as a pulley. There is a cone friction clutch mounted in the flywheel which is operated by a cam on the main shaft of the bed. This automatically releases the clutch on the up-stroke and applies a brake to the driving shaft. When it is desired to set the dies, the automatic clutch arrangement can be disengaged by loosening a nut on the lever shaft, and the machine can then be operated by the hand lever. Pressure on the foot treadle releases the brake and the clutch is thrown in by its weight which is cushioned in a dash pot.

The bed is 32 in. square and the stroke of the



A Recently Developed Press for the Deep Forming of Light Sheet Metal Parts and the Wiring of the Edges

slide is 20 in., which, it is pointed out, gives plenty of room for handling work at high speed. The total weight of the machine is about 7000 lb.

Safety and Sanitation for the Foundry

Newark Foundrymen's Association and State Labor Commissioner Discuss Features of the New Jersey Regulations

The meeting of the Newark Foundrymen's Association, Newark, N. J., held January 7, was devoted to a discussion of the safety and sanitation regulations imposed upon foundries of New Jersey by the laws administered by the State Department of Labor. The members of the association, who had turned out in good numbers, were agreeably surprised to find that as their guests they had Lewis T. Bryant, Commissioner of Labor, and John Roach, an inspector of foundries of the Department of Labor. After many criticisms had been passed upon the stipulations of the labor laws as they applied to foundries, suggestions of ways and means to meet the requirements had been heard and the two officials had stated their desire to be reasonable and fair in their enforcement of the statutes, the members agreed that the questions at issue were much better understood and that the meeting had been a profitable one. Commissioner Bryant and Inspector Roach were given a vote of thanks.

OTHER INDUSTRIES LOOKED AFTER FIRST

The labor laws of New Jersey which apply specifically to foundries became operative April 24, 1911, but only in comparatively recent time has the Department of Labor begun to insist vigorously on their enforcement. It had found far more urgent need of improving conditions in other industries. The law relating directly to foundries is as follows:

1. All entrances to foundries shall be constructed and maintained so as to minimize drafts. All passageways in foundries, now in operation or hereafter to be built, shall be constructed and maintained of sufficient width to make them reasonably safe for the workmen, and no unnecessary obstruction shall be allowed in such passageways during the hours of casting. Whenever a foundry is so constructed or operated that smoke, steam, dust or noxious gases are not promptly carried off by the general ventilation, exhaust fans shall be provided. Foundries shall be reasonably well lighted throughout the working hours and reasonably well heated during the cold and inclement weather. Hot water shall be kept available for washing purposes during the season in which artificial heating is necessary. When it is thought necessary and advisable by a State factory inspector, facilities shall be provided for drying the clothing of persons employed therein. All pits around furnaces in any such brass factory shall be covered with substantial iron gratings. All stairways around such furnaces shall be constructed of iron. There shall be kept on hand at all times in every foundry a reasonable supply of lime water, sweet oil, vaseline, bandages and absorbent cotton for use by the workmen in case of burns or accident. It is hereby made the duty of each and every State factory inspector to enforce the provisions of this act.

2. Any place or establishment where metal castings or cores are made shall be deemed a foundry within the meaning of this act.

SOME PROVISIONS CALLED IMPRACTICABLE

Gerald Hannay, Oscar Barnett Foundry Company, Irvington, N. J., president of the association, called on James Flockhart, Maher & Flockhart. Mr. Flockhart, whose foundry is the largest in Newark, took exception to almost every provision of the law. He could not conceive how passageways could

be kept free and clear at all times in a jobbing foundry. He was particularly exercised over a demand that he find some other means of heating his foundry than by means of salamanders or open fires. He had yet to see a large foundry, he said, which can be heated by other means in real cold weather; in fact, his experience had been that the men would not work without the salamanders. These devices are not mentioned in the law, but nevertheless their use had been objected to by the New Jersey authorities unless piping was provided to carry off smoke and gases. Mr. Flockhart believed in using steam heat so far as possible, but of itself it was not sufficient.

George A. Watts, Watts-Campbell Company, created some amusement with a story of a molder who went to work for the Brown & Sharpe Mfg. Company, but had returned to his old place of employment with the complaint that the foundry of the company mentioned was too clean and he could not work in it.

Franklin Phillips, Hewes & Phillips Iron Works, contended that the improvements suggested would not eliminate dust in the foundry and he cited the case of raising a large cope. As for the provision requiring that hot water be available for washing purposes, his experience was that most men washed at home and that many of them were running down the streets before the whistle stopped blowing. Referring to fumes, he pointed out that where large molds are made in the floor charcoal fires often have to be used to dry them. His firm was willing and anxious, however, to comply with the requirements of the State laws to the fullest possible extent.

SUGGESTIONS FOR RELIEF

H. P. Macdonald, Snead & Co., Iron Works, Jersey City, said that drafts could be minimized in many ways, among which he mentioned having windows higher than the men's heads and having suitable vestibules on doors. The use of salamanders was one of his problems, inasmuch as his company used them and the traveling cranes in their foundry prevented the use of piping to carry the gases which arise from them. Unquestionably, Mr. Macdonald said, these gases are bad for the men to breathe, but he could not see what harm such fumes could inflict when they ascended over the heads of the men. All of the questions raised, he thought, called for co-operation and he did not believe the State Department of Labor wanted them to maintain foundries in which work could not be done.

R. J. M. Welch, Samuel L. Moore & Sons Corporation, Elizabeth, said that his company had been treated fairly by the Department of Labor and he believed unhealthful conditions should be corrected. He found the new laws to work in the interest of his company as well as of its employees. Two points he made were that the men ordinarily would not wait to wash up before leaving for their homes and that most accidents result from the carelessness of the men. The foundry with which he is connected is heated by open fires, but the installation of a blower system is contemplated. At

the same time, he could not see what objection there could be to open fires if the gases rise to ventilators, unless there is danger of the building being ignited.

ONE FOUNDRY'S USE OF EXHAUST STEAM

Denis F. O'Brien, A. P. Smith Mfg. Company, said that drafts could be minimized by a proper arrangement of windows and that the objectionable feature of smoke, steam and dust can be taken care of by a suitable heating system which would cause the gases to rise with the hot air. He had tried salamanders, but found them a nuisance and in their place had adopted two coils, one in each end of the foundry, which utilized exhaust steam from the air compressors and maintained a temperature of from 55 to 60 deg. when there was zero weather outside. The cost of this heating was negligible; whereas to heat the foundry in question with twelve salamanders, the number necessary, would require about 6000 lb. of coke a day. With the coil system the heat is uniformly distributed as it would not be with the open fires. His company had provided hot water for its men, but few of them availed themselves of it, preferring to hurry away. Mr. O'Brien said that many of the measures which at first seem hard to comply with, in the end turn out to be to the advantage of the employer and that the results offset any temporary disadvantage.

Mr. Flockhart remarked that the conditions in the foundry of the A. P. Smith Mfg. Company, where valves are an important output, could not be compared with those of a jobbing foundry.

Mr. Macdonald repeated his assertion made before the recent meeting of the National Founders' Association that he had found the seeming increase in accidents since the passage of the New Jersey liability law to be more statistical than actual. Incidentally he remarked that since the men in his foundry had been compelled to use goggles when pouring there had been no accidents to eyes. His company had also obtained a supply of molders' shoes which they sold at cost and since these had been used none of the molders' feet had been injured.

RECOGNIZES EMPLOYERS' RIGHTS

Commissioner Bryant said he had not made the labor laws and it was not his place to criticize them, but he aimed to seek and find the most reasonable methods of insuring the maximum amount of protection. While he was trying to benefit the employee, he had full cognizance of the vested rights of employers. He repeated the assertion, so often made, that the American people are the most prodigal on earth in sacrificing life and limb, and said that if the supremacy of the nation is to be preserved there must be the utmost prevention of industrial accidents and occupational diseases. If those inclined to complain could show him an order issued by his department which was unfair he would cancel it. He alluded to a recent factory fire in Newark in which many lives were lost and said that accidents involving freight elevators, belts and slipping ladders exacted just as many lives, though in a less spectacular manner, and therefore aroused no furore of indignation.

ENFORCEMENT TO SOME EXTENT OPTIONAL

The commissioner pointed out that the extent to which the law should be applied was in some particulars left optional with him—the matter of minimizing drafts, for instance. That it is a serious matter to have cold air strike overheated men no one could deny. He agreed with previous re-

marks to the effect that by means of high windows, vestibuled doors and the proper working out of ventilating details much trouble could be avoided. While the law stated that fans should be used wherever required, this must be determined in individual cases. Providing hot water for washing is mandatory, whether or not the men take advantage of what is supplied. He was at a loss to understand why any man who cares to wash his hands and face before eating should be denied the privilege. He also thought no one could object to the requirement that there be on hand at all times materials for first aid treatment in case of burns or accident as proper care of a small burn or cut might avert serious results later. As to the elimination of dust, fumes, etc., he hoped the foundrymen would meet the department half way in securing betterment.

INTERESTING EMPLOYEES IN PREVENTING ACCIDENTS

With regard to keeping passageways safe Commissioner Bryant said he assumed the law meant that they should be kept as clear as possible and that the matter was really one of good discipline and good housekeeping, which would obviate the danger of men tripping and stumbling when carrying ladles. He referred to his plan of appointing factory chiefs, who were supplied with a medal and literature on safety by his department. In this way he got scores of men interested in promoting safety. The next step is to appoint safety committees as many large manufacturing plants now do. In three months' time the Raritan Copper Works, which employs many foreign laborers, had greatly reduced the number of accidents around its plant. Factory chiefs throughout the State had held two meetings, one of which was attended by between 700 and 800 men and the other by 2800 men.

Commissioner Bryant advocated the establishment of a museum of safety in Newark and a resolution was adopted declaring that the manufacturers of Newark and vicinity would be greatly benefited by such an institution.

GOOD AND BAD FOUNDRIES

Inspector Roach said he had visited many foundries and found some good, some medium and some very bad in their safety and sanitary features. He told of one in northern New Jersey where disgusting sanitary conditions prevailed. He had found some foundries where there were monitors and monitor windows which afforded all the ventilation possible, whereas in others the air was so thick that it was dangerous for men to carry ladles around. The fact that the men had to move quickly in pouring time made the conditions all the more dangerous. It was wrong that men should have to work in an atmosphere so polluted that it made them "dopy" and confused. He suggested in such foundries the installation of disk fans to draw off smoke and fumes. In some pickling rooms he had found little natural ventilation, and the men certainly must suffer from inhaling the fumes from vitriol. In these cases, artificial ventilation was recommended. Mr. Roach also advanced arguments in favor of using goggles and gaiters in the foundry and hoods over emery wheels. He was convinced that no emery wheel was safe unless covered by a safety hood. Open gangways he declared to be good practice and good policy.

The name of the Browning Engineering Company, Cleveland, Ohio, has been changed to the Browning Company.

ESTABLISHED 1855

THE IRON AGE

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Passing the Depth of the Depression

Numerous evidences of slackened trade have made their appearance within the past week or two. Some of these are so striking and so much worse than any previous recent showing that the conclusion is almost forced that we have seen the culmination of the depression. Among these developments have been such important matters as the huge increase of 43,509,438 lb. in the stock of merchantable copper at the close of December; the heavy gain in idle freight cars reported January 1, when the surplus was 188,850, showing 87,305 more than reported two weeks earlier; the decline in pig-iron production in December to under 2,000,000 tons, or the lowest monthly production since August, 1911; the serious decrease in railroad earnings as compared with the closing months of 1912, and the reports coming from various industrial centers of the number of persons out of employment about January 1. Such concrete facts as these are the measure of the falling off in business which was foreshadowed by trade reports in November and December. At that time such a slowing up in industry was indicated that the figures now coming out were simply to have been expected.

That we have definitely turned the corner—hence that from this time forward an improvement in business is to be expected—appears to be established by the developments since the opening of the new year. The depression in business in November and December was so widespread and so thorough that the movement of merchandise, the purchase of fresh supplies and the output of manufactured goods were all very much under the average rate in normal times. Special causes brought about this condition of affairs, prominent among which were the scarcity of money, the putting into effect of a new tariff law and the pending banking and currency legislation. None of these is now a factor in affecting business. Money is so abundant that the financial interests of leading cities are actively seeking commercial paper for discount. The new tariff duties are not creating serious disturbance in any direction. The banking and currency question has been settled by the passage of a law which is now looked upon as likely to be productive of beneficial results. That investors are again taking heart is shown by the heavy increase in the demand for bonds. The stock market, which is regarded as an indicator of the future, has latterly shown quite a change in the sentiment of speculators and prices of stocks are appreciating. The news from the

industries is decidedly more favorable of late, as a heavier demand is experienced for all kinds of raw material and manufactured products, and works which have been idle for some little time are resuming operations.

It would be too much to expect an immediate return of prosperous conditions, but the business of the country certainly appears to be recovering and there is vastly greater hope for the future than was warranted a month ago.

Long-Time Steel Contracts

The American Metal Market, of New York, has recently discovered that so-called contracts for iron and steel products are really only options. With the zeal of a defender of truth newly embraced, it has laid about it vigorously, urging, as Hamlet urged the players, that the steel trade "reform altogether" its bad habit and do away with the jug-handled contracts. Whether due to the lonesomeness reformers now and then feel, or to disappointment at the size and response of its audience, this contemporary varied its preachment a few days ago to point out that while it has been crying loudly for this reform "the rest of the iron trade press has been practically silent."

This dereliction ought to be explained, and perhaps it can be explained. It may be a case of singers one by one dropping out of a chorus, to listen to a new voice that has taken up the refrain. There may have been some curiosity, indeed, on the part of the silent listeners to see if the familiar bars were correctly sung. But here we confess to some disappointment. Instead of the difficulty steel manufacturers have found in breaking up the option evil—a difficulty recognized in all the discussion of this question that has gone on for these years—the new voice assures us that "the argument is very simple, consisting chiefly in showing how ridiculous the practice is." Somehow we recall that in manufacturers' meetings—in particular, one of the American Iron and Steel Institute held in New York more than three years ago—some of the speakers found that the blanket contracts had a reason for being. The argument was not so very simple then, nor did the practice then seem so very ridiculous or so easy to stop, as this from an editorial in *The Iron Age* of October 20, 1910, commenting on the papers read at the above meeting, will show:

If buyers have refused to take out material on a falling market, either because they find they require less than they had counted on, or, as more often

happens, because the price has declined and they can buy at a less price elsewhere, it is true also that manufacturers, through their selling departments have sold heavily without due regard to the ability of the buyer to consume within the contract period. What is worse, manufacturers have sold without regard to their ability to deliver. They have also been known to fail on deliveries to contract customers, on a rising market, while accepting early delivery business from others who gladly paid a premium. There is no doubt, moreover, that the guaranteeing of prices against declines is an important item in the manufacturer's responsibility for present conditions. These guarantees are one of the evils chargeable against the early period of the consolidation régime in the steel industry. Buyers argued at that time that natural laws were to a large extent inoperative—meaning that the unrestrained competition that had previously prevailed was gone—and that the prices asked were in a sense artificial. To stimulate demand under such conditions, sellers booked large contracts to which guarantees were attached. As independent mills were established they in turn were compelled to give like guarantees. Further, the practice of making blanket contracts covering a buyer's requirements is chargeable in part with the abuses that are now plaguing the manufacturer.

The American Iron and Steel Institute will do a great service to both manufacturers and consumers of steel if it brings about a return to old-fashioned contract observance in the iron and steel trades. Its first task will be with its own members. It may almost be said that the matter rests entirely with the manufacturers. If they can do away with that type of salesmanship which sells without regard to the seller's ability to deliver or the buyer's ability to consume, they will have taken a long step toward the desired end. A further long step will be the keeping of contract deliveries by the manufacturer when markets are advancing.

Little more than a year after the New York meeting of October, 1910, found the leading steel companies selling far into the future at the lowest prices in years. In 1912, particularly on bars, more low-priced contracts were entered into; and when new business was declining so rapidly last fall, some makers were still delivering bars at 1.20 cents. This was better than the 1.05 cent basis of early 1912, but far short of the early-delivery prices of late 1912 and early 1913. That steel manufacturers have not been repeating in recent weeks the selling mistakes of two years ago is due in part to the suddenness with which business dropped off in November. All had orders on their books on which prices would have been promptly revised to the basis fixed by new sales. It was plain that consumers were not in any such readiness to buy for restocking as in the months just before and just after January 1, 1912. On the contrary, the long heralded and often reiterated purpose of the new tariff law—to bring lower prices for products in all lines—had been cutting down new buying for months while the country used up all its high-priced stocks. The plunge of November produced conditions under which neither buyer nor seller was likely to enter into long time contracts. Such contracts have commonly come after declines extending over months. Some buyers have lately been willing to buy far ahead, it is true, but at their own price, and even of such the number is not great.

The time seems opportune for a shortening of the sale period, say to three months for jobbing or merchant buyers and to six months as a maximum for manufacturing consumers. In the exceptional

cases in which manufacturing operations require yearly contracts, provision might be made, it has been suggested, for cancellations of unspecified tonnages by quarterly periods, with maximum and minimum amounts, the former not to exceed the latter by more than 25 per cent. Shortening the contract period is the crux of the matter. That would go far toward eliminating the speculative buying that has been the arch disturber of contract relations.

The New Pig Iron Association

The formation of the American Pig Iron Association in New York City last week, as referred to elsewhere, recalls the efforts made in 1898 to bring into a national organization all the producers of foundry and forge pig iron. The movement of 15 years ago was carried forward by districts and for some weeks with good hopes of success. The promoters had even gone to the point of deciding on a name, which was the National Association of non-Bessemer Pig Iron Manufacturers. The object of that movement was to contrive in some way to take off the market, by exportation or otherwise, a surplus production which, for years following the panic of 1893, was plaguing the trade. Blast-furnace companies were scarcely making ends meet. But with all the incentive to concerted action, with no such ban on associated effort by manufacturers as exists today, and with every energy and talent of leaders in the trade trained upon the problem, the movement fell short of success. The various district associations, particularly in the South, in eastern Pennsylvania and in the Mahoning and Shenango valleys, were continued, but the effort to organize nationally was finally abandoned.

The sequel of this movement was one of the strange turns which have time and again made iron trade history stranger than fiction. Natural causes brought about what herculean efforts of men could not accomplish. Only a few months later the country began to emerge from depression, and 1899 saw the well remembered boom in pig iron, which carried prices nearly 150 per cent. above the starveling level of 1898, giving many furnace companies profits which one year before they dared not dream could ever come again.

The announcement made concerning the association formed last week indicates that there is no intention of aiming at curtailment of output or even indirect regulation of prices, which were avowed objects of the movement of 1898. The iron and steel trades, for reasons well known, would be the last to think of any such undertaking, and disavowals on that point are superfluous. The new association will probably follow, though with better organization, the lines on which the Eastern Pig Iron Association has proceeded for so many years. Nothing is better known than that the influence of that association on market prices has been negligible. Apart from the collection of statistics, the American Pig Iron Association will have a good field of operations in unifying contract forms (though steel makers could now do well to take a leaf from the blast furnacemen's book on this subject), in standardizing pig iron grades and in kindred work. There is

abundance to occupy it in lines which can have no interest for the Department of Justice.

Accident Risks from Crowded Equipment

Even in manufacturing plants where the causes of accidents have been carefully studied and classified, the crowding together of equipment has proved a prolific source of injury. The tendency is to economize on floor space, on the theory that the greater the degree of production per square foot of area the less the overhead cost. Instead of extending a building the machinery is brought closer together, and new equipment is squeezed into vacant spaces. Some saving is made, but against this (if only the pecuniary viewpoint is taken) must be set the cost of increased hazard.

No matter how thoroughly safeguarded machinery may be, the chance always exists of a man being caught in gearing or other moving parts. Where the space surrounding a machine is crowded the risk is increased in a very large way, not only while a man's machine is operating, but also when he is making preparations to begin work. The good mechanic works with a good deal of concentration at times, thinking of the task in hand and not of surrounding dangers. He gets caught in the machinery and the owner has to pay a bill of damages, often amounting to much more than interest on the investment that should have been made to procure reasonable space for equipment. Before workmen's compensation became general the owner often escaped liability on the ground that the accident was due to contributory negligence or to the negligence of a fellow servant. But now in many States the employer must pay damages for all accidents, and the laws of several of them place the amounts at very substantial figures.

The records of one great plant indicate that formerly when equipment was crowded together the accident rate was much higher than it is today. Men are now given plenty of elbow room in their employment. No longer is it necessary for an operative or a repair hand to squeeze in between dangerous machinery.

Correspondence

Errors in Combustion Carbon Analyses

To the Editor: Referring to the article published in your issue of January 1, by Wm. R. Fleming, metallurgist Andrews Steel Company, Newport, Ky., will you give space to the following comments:

Mr. Fleming says there is a difference of opinion concerning the physical condition of the steel after burning, some believing that accurate results are obtained if the drillings have been fused during combustion. Mr. Fleming most emphatically says that this idea is a nightmare, and that on the other hand if drillings happen to be a little thick, low results are obtained unless the drillings are perfectly fused.

In the last three years I have made in our laboratory several thousand carbon determinations

on pig iron, and having personally investigated this "nightmare," I most emphatically state that when dealing with pig iron the fusion of drillings during combustion is always and invariably a cause of low results, and we would not think of taking as correct the results obtained in such a determination.

That this is true in steel analysis I could not positively state, as I have determined the carbon in only a few score of steels; but it seems logical that it should hold true, although the error incurred in the case of steel would be proportionately smaller as the carbon percentage is a good deal lower than in pig iron. As to the escape of CO from the tube during a too rapid feeding of oxygen, Mr. Fleming says he has shown this to be a "nightmare," also. Any chemist, as I have done, may easily prove the presence of CO in the gases after absorption by attaching, behind the absorption apparatus a tube filled with copper oxide and heated with a gas flame, then absorbing the gas in barium hydrate solution. The error that may be introduced by CO escaping may be as high as 0.3 to 0.4 per cent. in a 4 per cent. carbon pig when using 1 gram for the determination.

That this would hold good in steel analysis I do not know, since all of our investigations in this line have been confined to pig iron analysis; but if I have well understood the facts set forth by R. Schenk in his treatise on physico-chemistry, in the chapter dealing with the reversibility of the reactions of carbon gases in the presence of iron, I believe that this will be true also in the case of steel, although the error so introduced will be necessarily smaller than in the case of pig iron, steel being of lower carbon content.

L. SELMI,
Chief Chemist Lake Superior
Iron & Chemical Company.

ASHLAND, WIS., January 6, 1914.

Unfilled Orders Decrease

The monthly unfilled tonnage report of the United States Steel Corporation, made public Saturday, January 10, showed unfilled orders on the company's books as of December 31, aggregating 4,282,108 tons. This represents a decrease of 114,239 tons in the month, against 490,018 tons in November and 219,683 tons in October. The total at the end of December was the smallest since November, 1911. The table below gives the unfilled tonnage for each month back to December 31, 1910, and previous to that for the end of each year:

December 31, 1913..4,282,108	January 31, 1912...5,379,721
November 30, 1913..4,396,347	December 31, 1911...5,084,761
October 31, 1913...4,513,767	November 30, 1911...4,141,955
September 30, 1913..5,003,785	October 31, 1911...3,694,328
August 31, 1913...5,223,468	September 30, 1911...3,611,317
July 31, 1913.....5,399,356	August 31, 1911...3,584,085
June 30, 1913.....5,807,317	July 31, 1911.....3,695,935
May 31, 1913.....6,324,322	June 30, 1911.....3,361,058
April 30, 1913.....6,978,762	May 31, 1911.....3,113,187
March 31, 1913.....7,468,956	April 30, 1911.....3,218,704
February 28, 1913..7,656,714	March 31, 1911.....3,447,301
January 31, 1913..7,827,368	February 28, 1911..3,400,543
December 31, 1912..7,932,164	January 31, 1911..3,110,919
November 30, 1912..7,852,883	December 31, 1910..2,674,757
October 31, 1912..7,594,331	December 31, 1909..5,927,031
September 30, 1912..6,551,507	December 31, 1908..3,603,527
August 31, 1912...6,163,375	December 31, 1907..4,624,552
July 31, 1912.....5,957,079	December 31, 1906..8,459,719
June 30, 1912.....5,807,346	December 31, 1905..7,605,086
May 31, 1912.....5,750,983	December 31, 1904..4,696,203
April 30, 1912.....5,664,885	December 31, 1903..3,215,123
March 31, 1912...5,304,841	December 31, 1902..5,347,523
February 29, 1912..5,454,200	

The decline in unfilled orders in 1913 is shown to have been 3,650,056 tons, or 46 per cent. The falling off in December is much less than the average of 304,000 tons a month for the year.

PIG IRON MAKERS ORGANIZE

Formation of the American Pig Iron Association —Its Objects

The outcome of a movement that has been on foot for some time, originating with blast furnacemen of the Central West, is told in the following statement which was given out by the general secretary of the American Pig Iron Association after the meeting to which it refers:

"At a very largely attended meeting of blast furnace operators representing the entire merchant pig iron industry of the United States, held January 8 in New York, there was organized the American Pig Iron Association, comprising plants with an aggregate annual capacity of 13,639,000 tons of iron and of a property investment of about \$200,000,000.

"The purposes of this association, as announced by the bylaws, shall be the discussion of all problems entering into the manufacture and sale of pig iron and the standardization as far as practicable of all grades, the securing of equitable freight rates, the cultivation of closer relationship with customers, the discussion of methods for improving the quality of service given to the users of the product, and, as a result of research and investigation of new methods, the reducing of the cost and the improvement of the quality of the iron produced, as well as the adoption of a uniform form of contract to be used between producer and consumer.

"The number of blast furnaces represented at this meeting were 53 furnaces in the southern district, 22 furnaces in the Virginia district, 54 furnaces in the eastern district and 78 furnaces in the western district, totaling 207 with a combined annual capacity of 13,639,000 tons. The officers of the association are: President, Joseph G. Butler, Jr., Youngstown; vice presidents—Chicago district, M. Cochrane Armour, Iroquois Iron Company; central district, Joseph H. Frantz, Columbus Iron & Steel Company; Buffalo district, W. A. Rogers, of Rogers, Brown & Co.; Philadelphia district, Leonard Peckitt, Empire Steel & Iron Company; Virginia district, John B. Newton, Virginia Iron, Coal & Coke Company; treasurer, Frank B. Richards, M. A. Hanna & Co., Cleveland; general secretary, John A. Penton, Iron Trade Review, Cleveland."

DETAILS OF OPERATION

It is stated that for the purposes of the association the country has been divided into six districts, with a vice-president for each. In these districts monthly meetings will be held and any information in the form of statistics or other matter of common interest will be transmitted at once to members in the other districts. Provision is made for a general quarterly meeting of the association to be attended only by executive officers of the different companies or their accredited representatives. Merchant pig iron as referred to in the by-laws of the association means all grades of foundry and malleable, as well as basic and Bessemer steel-making irons. Membership may be held in the association by companies which consume a part of their pig iron and sell the remainder in the market. It was decided at the meeting that all action taken should be in accord with the Department of Justice at Washington and copies of the by-laws and of the minutes of the meeting were ordered sent to the Attorney General.

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At a luncheon at the Hotel La Salle, Chicago, January 12, representatives of the foundry interests at Chicago took steps looking to the organization of committees for service during the convention of the allied foundrymen's associations to be held in that city September 7 to 12. A temporary organization, of which C. B. Carter, American Brake Shoe & Foundry Company, was chosen chairman, and O. J. Abell, secretary, will develop plans for the permanent committees. The executive board of the allied foundrymen's associations, of which A. E. Howell is chairman, and R. A. Bull secretary, will meet at Chicago January 17.

The Taylor-Wharton Iron & Steel Company, High Bridge, N. J., announces the opening of its Western sales office at 509 Insurance Exchange Building, 433 California street, San Francisco, with Richard D. Chapman in charge as sales manager. Mr. Chapman will also be in charge of the company's offices at Salt Lake City, Seattle and Los Angeles. The sale of all the company's products will be handled through these offices, including Tisco manganese steel castings, manganese steel track work, forgings and manganese steel repair parts for steam shovels and gold dredges.

The Iron and Metal Markets

BETTERMENT GENERAL

Steel Corporation Working 56 Per cent.

A 50,000-Ton Sale of Pipe Iron—Sheet Trade on a Firmer Basis

Steel mill resumption, after one of the longest and most extensive holiday shutdowns the industry has known, have indicated improvement, but it should not be overestimated, as has been done in some Pittsburgh dispatches.

At the same time it has been shown, in an effort made last week to sum up the number of idle men in the metal industries, that unfavorable conditions also can be overstated. The list of idle blast furnaces in the misleading "million-idle-men" exhibit paraded in Congress Tuesday contains at least eight large stacks that were only banked over the holidays and have since resumed. Not a single deduction was made for the three score or more furnaces that have blown in in the ten months covered by the figures.

Leaders in the steel industry agree in finding the situation better this week, but it is not forgotten that the comparison is with a fortnight of very low-rate production and the possible setbacks of February are not overlooked.

The Steel Corporation's rate of ingot production, which was 50 per cent in the first week of the year, was 56 per cent at the opening of this week. That is a fair measure of the change.

Statements as to increased buying of steel products are not specific, but some consumers have contracted for the first quarter at prices they would not consider four weeks ago. It cannot be said that the 1.15c., Pittsburgh, basis for plates and shapes has entirely disappeared, but it is rare and has applied to a few large transactions. The 1.20c. price is the rule for first quarter deliveries.

The industry is still getting on with a minimum of railroad buying, even while sentiment is growing in favor of a rate advance which is now commonly put at 3½ per cent. A Western road has bought 10,000 to 12,000 tons of tie plates. The rail inquiries of the Southern Railway and the Seaboard Air Line together amount to 45,000 tons. The mills now look to February to bring out long withheld rail business. In cars the week's orders amount to 2650, of which the Santa Fe gave out 800 and the Kanawha & Michigan 1100.

The wire trade was given a filip by the withdrawal of quotations which were \$1 or more a ton below the assumed market, but not until after considerable business had been put on the books.

Bar sales have been a good feature and there has been satisfactory specifying from the agricultural implement trade.

Good reports persist from the cast iron pipe makers. St. Paul has just opened bids for 4000 tons and Chicago will award 5200 tons next week, while the New York Board of Water Supply will open bids January 27 on 3800 tons of flexible joint pipe for Staten Island.

The sheet trade is in better condition than for three or four months, and some mills have established \$1 advance from the low point.

Indications point to a good year for the wrought pipe mills in their oil country products. The Phila-

delphia Company is about to buy 12,000 tons of pipe and oil well supplies.

The sheet bar market has been more active, with the increase in sheet mill operations, and competition has sharpened, resulting in sales at \$20 at Youngstown.

Pig iron sales have been heavy in the past two weeks and prices in all district suffered. Chicago business was 60,000 to 70,000 tons; Buffalo's total was fully 100,000 tons and one sale of Southern iron to the leading pipe interest was 50,000 tons. Some of the low Buffalo prices have been withdrawn, but \$12.50 can still be done in that district. Some further blowing out of merchant furnaces is looked for before pig iron takes on strength.

A good deal of blast furnace coke is still under negotiation. Furnace companies that will not pay \$1.85 to \$1.90, which is the range on a total of 100,000 tons a month recently closed for the half year, are able to buy February coke at \$1.75 at ovens.

A turn in the scrap market is represented by an advance of 25 cents for melting steel at Chicago, after much had been shipped out of that district, and of 50 cents in the Pittsburgh district.

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous.

	Jan. 14, 1914.	Jan. 7, 1914.	Dec. 17, 1913.	Jan. 15, 1913.
Pig Iron, Per Gross Ton:	1914.	1914.	1913.	1913.
No. 2 X, Philadelphia...	\$14.50	\$14.85	\$15.25	\$18.50
No. 2, Valley furnace...	12.75	13.00	13.50	17.50
No. 2 Southern, Cinti...	14.00	14.00	13.75	16.75
No. 2, Birmingham, Ala.	10.75	10.75	10.50	13.50
No. 2, furnace, Chicago*	14.00	14.00	14.00	13.00
Basic, del'd, eastern Pa.	14.00	14.00	15.00	13.00
Basic, Valley furnace...	12.50	12.50	12.75	16.35
Bessemer, Pittsburgh...	14.90	15.15	15.90	18.15
Malleable Bess., Ch'go*	14.00	14.00	14.50	18.00
Gray forge, Pittsburgh...	13.65	13.90	13.90	17.15
L. S. charcoal, Chicago...	15.25	15.25	15.25	18.00

Billets, etc., Per Gross Ton:	20.00	20.00	20.00	28.50
Bess. billets, Pittsburgh.	20.00	20.00	20.00	29.00
O.-h. billets, Pittsburgh.	20.00	21.00	21.00	29.50
O.-h. sheet bars, P'gh...	20.00	24.00	24.00	36.00
Forging billets, P'gh...	21.50	21.50	22.40	32.00
O.-h. billets, Phila...	25.50	25.00	25.00	31.00
Wire rods, Pittsburgh...				

Old Material, Per Gross Ton:	13.00	13.00	13.00	17.50
Iron rails, Chicago...	15.50	15.50	15.50	18.00
Carwheels, Chicago...	11.50	11.50	12.00	17.25
Carwheels, Philadelphia...	12.00	12.00	12.00	16.25
Heavy steel scrap, P'gh...	11.00	10.50	11.00	15.00
Heavy steel scrap, Phila...	10.00	10.00	10.00	14.50
Heavy steel scrap, Ch'go.	9.25	9.00	9.00	12.75
No. 1 cast, Pittsburgh...	10.75	10.75	12.00	14.50
No. 1 cast, Philadelphia...	12.00	12.00	12.00	15.00
No. 1 cast, Ch'go (net ton)	10.25	10.00	9.75	13.00

Finished Iron and Steel,				
Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Bess. rails, heavy, at mill	1.25	1.25	1.25	1.25
Iron bars, Philadelphia...	1.20	1.20	1.22½	1.77½
Iron bars, Pittsburgh...	1.35	1.35	1.35	1.70
Iron bars, Chicago...	1.12½	1.10	1.10	1.57½
Steel bars, Pittsburgh...	1.20	1.20	1.20	1.70
Steel bars, New York...	1.36	1.36	1.36	1.86
Tank plates, Pittsburgh...	1.20	1.20	1.20	1.75
Tank plates, New York...	1.36	1.36	1.36	1.91
Beams, etc., Pittsburgh...	1.20	1.20	1.25	1.75
Beams, etc., New York...	1.36	1.36	1.41	1.91
Skelp, grooved steel, P'gh.	1.20	1.20	1.20	1.45
Skelp, sheared steel, P'gh.	1.30	1.30	1.30	1.50
Steel hoops, Pittsburgh...	1.35	1.35	1.40	1.60

Sheets, Nails and Wire,				
Per Lb. to Large Buyers:				
Sheets, black, No. 28, P'gh	1.85	1.85	1.90	2.35
Galv. sheets, No. 28, P'gh.	2.85	2.85	2.90	3.50
Wire nails, Pittsburgh...	1.55	1.50	1.55	1.75
Cut nails, f.o.b. East'n mills	1.65	1.65	1.65	1.75
Cut nails, Pittsburgh...	1.55	1.55	1.55	1.70
Fence wire, base, P'gh...	1.35	1.30	1.35	1.55
Barb wire, galv., P'gh...	1.95	1.90	1.95	2.15

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

Coke, Connellsville,

Per Net Ton at Oven:	Jan. 14, 1914.	Jan. 7, 1914.	Dec. 17, 1913.	Jan. 15, 1913.
Furnace coke, prompt...	\$1.85	\$1.85	\$1.75	\$4.00
Furnace coke, future...	2.00	2.00	1.80	3.25
Foundry coke, prompt...	2.50	2.50	2.50	4.50
Foundry coke, future...	2.60	2.60	2.60	3.75

Metals,

Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York...	14.50	15.12 1/2	14.75	17.25
Electrolytic copper, N. Y.	14.00	14.87 1/2	14.37 1/2	17.00
Spelter, St. Louis...	5.10	5.15	5.00	7.10
Spelter, New York...	5.25	5.30	5.15	7.25
Lead, St. Louis...	3.97 1/2	4.05	3.85	4.20
Lead, New York...	4.10	4.15	4.00	4.35
Tin, New York...	36.70	36.60	37.75	51.00
Antimony, Halletts, N. Y.	7.00	7.00	7.00	9.37 1/2
Tin plate, 100-lb. box, P'gh	\$3.40	\$3.40	\$3.40	\$3.60

Finished Iron and Steel f. o. b. Pittsburgh

Freight rates from Pittsburgh, in carloads, per 100 lb., New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Louis, 22 1/2c.; Kansas City, 42 1/2c.; Omaha, 42 1/2c.; St. Paul, 32c.; Denver, 84 1/2c.; New Orleans, 30c.; Birmingham, Ala., 45c.; Pacific coast, 80c. on plates, structural shapes and sheets No. 11 and heavier, 85c. on sheets Nos. 12 to 16; 95c. on sheets No. 16 and lighter; 65c. on wrought pipe and boiler tubes.

Plates.—Tank plates, 1/4 in. thick, 6 1/4 in. up to 100 in. wide, 1.20c., base, net cash, 30 days. Following are stipulations prescribed by manufacturers with extras:

Rectangular plates, tank steel or conforming to manufacturer's standard specifications for structural steel dated February 6, 1903, or equivalent, 1/4 in. and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per sq. ft., are considered 1/4-in. plates. Plates over 72 in. wide must be ordered 1/4 in. thick on edge, or not less than 11 lb. per sq. ft., to take base price. Plates over 72 in. wide ordered less than 11 lb. per sq. ft. down to the weight of 3-16 in. take the price of 3-16 in.

Allowable overweight, whether plates are ordered to gauge or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

Extras.

Cents per lb.

Gauges under 1/4 in. to and including 3-16 in....	.10
Gauges under 3-16 in. to and including No. 8....	.15
Gauges under No. 8 to and including No. 9....	.25
Gauges under No. 9 to and including No. 10....	.30
Gauges under No. 10 to and including No. 12....	.40
Sketches (including straight taper plates) 3 ft. and over.....	.10
Complete circles 3 ft. in diameter and over.....	.20
Boiler and flange steel.....	.10
"A. B. M. A." and ordinary firebox steel.....	.20
Still bottom steel.....	.30
Marine steel.....	.40
Locomotive firebox steel.....	.50
Widths over 100 in. up to 110 in., inclusive.....	.05
Widths over 110 in. up to 115 in., inclusive.....	.10
Widths over 115 in. up to 120 in., inclusive.....	.15
Widths over 120 in. up to 125 in., inclusive.....	.25
Widths over 125 in. up to 130 in., inclusive.....	.50
Widths over 130 in.....	1.00
Cutting to lengths, under 3 ft., to 2 ft. inclusive.....	.25
Cutting to lengths, under 2 ft., to 1 ft. inclusive.....	.50
Cutting to lengths, under 1 ft.....	1.55

No charge for cutting rectangular plates to lengths 3 ft. and over.

Structural Material.—I-beams, 3 to 15 in.; channels, 3 to 15 in.; angles, 3 to 6 in. on one or both legs, 1/4 in. thick and over, and zees, 3 in. and over, 1.20c. to 1.25c. Extras on other shapes and sizes are as follows:

Cents per lb.

I-beams over 15 in.....	.10
H-beams over 18 in.....	.10
Angles over 6 in. on one or both legs.....	.10
Angles, 3 in. on one or both legs, less than 1/4 in. thick as per steel bar card, Sept. 1, 1909.....	.70
Tees, structural sizes (except elevator, hand rail, car truck and conductor rail).....	.05
Channels and tees, under 3 in. wide, as per steel bar card, Sept. 1, 1909.....	.20 to .80
Deck beams and bulb angles.....	.30
Hand rail tees.....	.75
Cutting to lengths, under 3 ft., to 2 ft. inclusive.....	.25
Cutting to lengths, under 2 ft., to 1 ft. inclusive.....	.50
Cutting to lengths, under 1 ft.....	1.55

No charge for cutting to lengths 3 ft. and over.

Wire Rods.—Bessemer, open-hearth and chain rods, \$25.50 to \$26.

Wire Products.—Fence wire, Nos. 0 to 9, per 100 lb., terms 60 days or 2 per cent. discount in 10 days, carload lots to jobbers annealed, \$1.35; galvanized, \$1.75. Galvanized barb wire and fence staples, to jobbers, \$1.95; painted, \$1.55. Wire nails to jobbers, \$1.55. Prices of the foregoing wire products to dealers, in carload lots, are 5c. higher. Woven wire fencing, 74 1/2 per cent. off list for carloads; 73 1/2 off for 1000-rod lots; 72 1/2 off for less than 1000-rod lots.

The following table gives the price to retail merchants on fence wire in less than carloads, with the extras added to the base price:

Nos.	0 to 9	10	11	12&12 1/2	13	14	15	16
Annealed	\$1.55	\$1.60	\$1.65	\$1.70	\$1.80	\$1.90	\$2.00	\$2.10
Galvanized	2.00	2.00	2.05	2.10	2.20	2.30	2.70	2.80

Wrought Pipe.—The following are the jobbers' carload discounts on the Pittsburgh basing card on steel pipe in effect from October 27, 1913, and iron pipe from June 2, 1913, all full weight:

Butt Weld					
Steel.			Iron.		
Inches.	Black.	Galv.	Inches.	Black.	Galv.
1/2, 3/4 and 1	73	52 1/2	1/2 and 1/4	66	47
1 1/4	77	66 1/2	1 1/2	65	46
1 1/2 to 3	80	71 1/2	1 1/2 to 2 1/2	69	56
			2 1/2 to 3	72	6

Lap Weld				
2	77	63 1/2	1 1/2	56
2 1/2 to 6	79	70 1/2	1 1/2	67
7 to 12	76	65 1/2	2	68
13 to 15	53	..	2 1/2 to 4	70
			4 1/2 to 6	70
			7 to 12	68

Reamed and Drifted				
1 to 3, butt.....	73	69 1/2	1 to 1 1/2, butt... 70	59
2, lap.....	75	66 1/2	2, butt..... 70	69
2 1/2 to 6, lap....	77	68 1/2	1 1/4, lap..... 54	43
			1 1/2, lap..... 65	54
			2, lap..... 66	56
			2 1/2 to 4, lap.... 68	57

Butt Weld, extra strong, plain ends					
1/2, 3/4 and 1	68	57 1/2	1 1/2	63	52
1 1/4	73	66 1/2	1 1/2	67	60
1 1/2 to 1 3/4	77	70 1/2	1 1/2 to 1 3/4	71	62
2 to 3	73	71 1/2	2 and 2 1/2	72	63

Lap Weld, extra strong, plain ends				
2	74	65½	1½	65
2½ to 4	76	67½	2	66
4½ to 6	75	66½	2½ to 4	70
7 to 8	68	57½	4½ to 6	69
9 to 12	63	52½	7 and 8	63
			9 to 12	58

Butt Weld, double extra strong, plain ends					
1/2	63	56 1/2	1 1/2	57	49
1 1/4	66	59 1/2	1 1/2 to 1 3/4	60	52
2 to 2 1/2	63	61 1/2	2 and 2 1/2	62	55

Lap Weld, double extra strong, plain ends					
2	64	57½	2	55	49
2½ to 4	66	59½	2½ to 4	60	54
4½ to 6	65	58½	4½ to 6	59	53
7 to 8	58	47½	7 to 8	52	44

To the large jobbing trade an additional 5 and 2 1/2 per cent. is allowed over the above discounts.

The above discounts are subject to the usual variation in weight of 5 per cent. Prices for less than carloads are two (2) points lower basing (higher price) than the above discounts on black and three (3) points on galvanized.

Boiler Tubes.—Discounts to jobbers, in carloads, in effect from January 2, 1914, are as follows:

Lap-Welded Steel		Standard Charcoal Iron	
1 1/2 and 2 in.....	61	1 1/2 in.....	45
2 1/2 in.....	58	1 1/2 and 2 in.....	49
2 1/2 and 2 1/2 in.....	64	2 1/2 in.....	45
3 and 3 1/2 in.....	69	2 1/2 to 2 1/2 in.....	54
3 1/2 and 4 1/2 in.....	71	3 and 3 1/2 in.....	57
5 and 6 in.....	64	3 1/2 to 4 1/2 in.....	60
7 to 13 in.....	61	5 and 6 in.....	49

2 1/2 in. and smaller, over 18 ft., 10 per cent. net extra.

2 1/2 in. and larger, over 22 ft., 10 per cent. net extra. Less than carloads will be sold at the delivered discounts for carloads, lowered by two points for lengths 22 ft. and under to destinations east of the Mississippi River; lengths over 22 ft., and all shipments going west of the Mississippi River must be sold f.o.b. mill at Pittsburgh basing discount, lowered by two points.

Sheets.—Makers' prices for mill shipment on sheets of U. S. Standard gauge, in carload and larger lots, on which jobbers charge the usual advance for small lots from store, are as follows, f.o.b. Pittsburgh, terms 30 days net or 2 per cent. cash discount in 10 days from date of invoice:

Blue Annealed Sheets		Cents per lb.	
Nos. 3 to 8	1.40 to 1.45		
Nos. 9 and 10	1.45 to 1.50		
Nos. 11 and 12	1.50 to 1.60		
Nos. 13 and 14	1.55 to 1.65		
Nos. 15 and 16	1.65 to 1.70		

Box Annealed Sheets, Cold Rolled		Cents per lb.	
Nos. 10 and 11	1.50 to 1.60		
No. 12	1.50 to 1.60		
Nos. 13 and 14	1.55 to 1.65		
Nos. 15 and 16	1.60 to 1.70		
Nos. 17 to 21	1.65 to 1.75		
Nos. 22 and 24	1.70 to 1.80		
Nos. 25 and 26	1.75 to 1.85		
No. 27	1.80 to 1.90		
No. 28	1.85 to 1.95		
No. 29	1.90 to 2.00		
No. 30	2.00 to 2.10		

Galvanized Sheets of Black Sheet Gauge

	Cents per lb.
Nos. 10 and 11	1.85 to 1.95
No. 12	1.95 to 2.05
Nos. 13 and 14	1.95 to 2.05
Nos. 15 and 16	2.10 to 2.20
Nos. 17 to 21	2.25 to 2.35
Nos. 22 and 24	2.40 to 2.50
Nos. 25 and 26	2.55 to 2.65
No. 27	2.70 to 2.80
No. 28	2.85 to 2.95
No. 29	3.00 to 3.10
No. 30	3.15 to 3.25

Pittsburgh

PITTSBURGH, PA., January 14, 1914.

The accounts being printed in the daily press and elsewhere as to the general improvement in the steel business are exaggerated to considerable extent. It is true that since the first of the year sentiment has been better, and consumers are willing to place contracts for some kinds of finished material at prices they would not have considered three or four weeks ago. Such improvement as exists is due to the fact that the mills have drawn a line on prices, and are refusing to make lower figures even if in doing so they are compelled to turn business down. On the other hand, there is no good ground now for the exaggerated pessimism which has broken out in some quarters. In finished material, plates, shapes and bars minimum prices have been fixed by a number of sellers at 1.20c., black sheets at 1.85c. and galvanized 2.85c. Conditions in the wire trade have been strengthened by the announcement made on Wednesday, January 7, by the American Steel & Wire Company that it had withdrawn all prices. Since that time a considerable tonnage of wire nails has been contracted for at \$1.55 base and other wire products at corresponding prices for delivery in the next 60 days or longer. Previous to this, the mills were entering orders at \$1 a ton less and in some cases \$1.50 on wire nails was shaded. Inquiry for pig iron is better and a good deal has been sold the past week for first quarter and first half delivery, but at low prices. The coke market is a waiting one, but the scrap trade is looking up for the first time in months.

Pig Iron.—Two of the Westinghouse interests are reported as in the market for a considerable tonnage of foundry and forge iron, but neither has yet bought. Prices on Bessemer continue weak, and several small sales have been made at \$14 or under, Valley furnace. Eight of the 12 Carnegie Steel Company's blast furnaces in the Pittsburgh and Youngstown districts that were banked during the holidays resumed blast January 2. A radiator manufacturer outside the Pittsburgh district is said to have closed for 3000 to 4000 tons of foundry iron for first half delivery on the basis of about \$12.75, Valley furnace, for No. 2. We quote standard Bessemer iron at \$14; basic, \$12.50; No. 2 foundry, \$12.75 to \$13; malleable Bessemer, \$12.75 to \$13; gray forge, \$12.75, for first quarter delivery, all at Valley furnace, the freight rate for delivery in the Pittsburgh district being 90c. a ton.

Billets and Sheet Bars.—Some unevenness has developed in prices of open-hearth sheet bars, which have been offered and sold in the past week or two on the basis of \$20, f.o.b., Youngstown mill. Sheet and tin-plate mills are taking more steel than for some months. We quote Bessemer and open-hearth billets at \$20; Bessemer sheet bars at \$21, and open-hearth sheet bars \$20, makers' mill, Pittsburgh or Youngstown. Forging billets are held at \$24 and axle billets about \$23, Pittsburgh.

Muck Bar.—The strike at the puddling plants of the A. M. Byers Company at Girard and the Youngstown Sheet & Tube Company at East Youngstown, Ohio, which began July 1 last year, has been called off by the Sons of Vulcan, and members of that labor organization are now trying to get positions in these two plants. No sales of muck bar have been reported in this market for some time, but prices are lower, due to the decline in the rate for puddling and lower prices ruling for mill iron. We quote best grades of muck bar, made from all pig iron, at nominally \$28, Pittsburgh.

Steel Rails.—Contracts for standard sections for this year's delivery are slow in coming out. Orders for light rails have quieted down and a large part of the business being placed is going to the rerolling mills, which are offering light rails at about \$2 a ton less than is being quoted by the mills using billets. We quote splice bars at 1.50c. and standard section rails at 1.25c. Light rails, rolled from billets, are quoted as follows: 25, 30, 35, 40 and 45 lb. sections, 1.25c.; 16 and 20 lb., 1.30c.; 12 and 14 lb., 1.35c. and 8 and 10 lb., 1.40c., all in carload lots, f.o.b., Pittsburgh.

Plates.—Steel car companies state they have no advices that the Union Pacific Railroad has bought 4000 box cars, 600 automobile cars and 400 stock cars, as reported. It is said, however, that the underframes for these cars have gone to the Bettendorf Company, Davenport, Iowa. The Pressed Steel Car Company has taken 200 steel hopper cars for the Buffalo Creek & Gauley Railroad, and the Cambria Steel Company has taken an order for 1000 steel coal cars for the Hocking Valley. The Wabash, St. Louis and Western, known as the Clover Leaf, is in the market for 1000 box cars, and the Sante Fe has placed 500 box cars and 300 automobile cars with the American Car & Foundry Company. The Wabash order for 1000 hoppers and 500 gondolas is still in the market. Local car companies say they have enough business on their books to keep them busy until March, but have little beyond that. The general demand for plates is quiet and no large jobs are in sight in which plates will be used. None of the plate mills is running full, but the tone of the market is stronger. We quote ¼-in. and heavier plates at 1.20c., f.o.b., Pittsburgh.

Structural Material.—Inquiry has been better, and considerable local work has been placed. The Jones & Laughlin Steel Company has taken 800 tons for additions to the power buildings of the H. J. Heinz Company and about 500 tons for the Magee Memorial Hospital, both in this city; the McClintic-Marshall Company, 600 tons for steel buildings for the new plant of the Franklin Steel Works, Franklin, Pa., and 3000 tons for new steel buildings for the American Zinc & Chemical Company, Burgettstown, Pa., with other contracts for small tonnages from several buyers; the American Bridge Company, 2000 tons for bridges for crossings for a Western railroad. It is claimed that 1.20c. is being firmly held. We quote beams and channels up to 15 in. at 1.20c. for desirable orders and 1.25c. for small lots f.o.b., Pittsburgh.

Wire Rods.—The market is stronger, due to the withdrawal of prices last week on all wire products and wire rods by the American Steel & Wire Company, which has announced that its price on wire rods is \$26. The new demand is quiet, however. We now quote Bessemer, open-hearth and chain rods at \$25.50 to \$26.

Skelp.—Some inquiry is in the market for grooved steel and sheared iron skelp, and the tone of the market is better. A sale is reported of about 2000 tons of sheared iron skelp at about 1.60c., delivered buyer's mills. We quote grooved steel skelp at 1.20c. to 1.25c.; sheared steel skelp, 1.30c. to 1.35c.; grooved iron skelp, 1.55c. to 1.60c., and sheared iron skelp at 1.60c. to 1.65c., Pittsburgh.

Iron and Steel Bars.—There has been a noticeable increase in specifications for steel bars from the agricultural implement makers, and shipments are heavier than for some time. The demand for reinforcing steel bars is active, several good-sized orders having been taken lately. Iron bars are quiet with prices fairly steady. We quote steel bars at 1.20c. for first quarter delivery, but for desirable business and prompt shipment probably 1.15c. could be done. We quote common iron bars at 1.35c. to 1.40c., Pittsburgh.

Sheets.—Conditions in this trade are better in every way than for three or four months. The demand is more active and specifications against contracts are coming in more freely. Some contracts have been placed for first quarter delivery on the basis of 1.85c. for No. 28 Bessemer black and 2.85c. for galvanized, but the buyers are required to furnish specifications for January shipment. We also note that some contracts for black and galvanized sheets have been made at \$1 a ton higher. Operations among the sheet mills

are on a larger scale, the American Sheet & Tin Plate Company running to about 75 per cent. of capacity, while others are doing about as well. We quote No. 28 Bessemer black sheets at 1.85c. for prompt delivery and 1.90c. for first quarter; No. 28 galvanized sheets at 2.85c. for prompt and 2.90c. for first quarter; Nos. 9 and 10 blue annealed sheets, 1.40c. prompt and 1.45c. for first quarter; No. 28 tin mill black plate, H. R. and A., 1.85c. to 1.90c., and Nos. 29 and 30 at 1.90c. to 1.95c. These prices are f.o.b. Pittsburgh, in carload and larger lots, jobbers charging the usual advances for small lots from store.

Tin Plate.—Specifications against the heavy contracts made late last year are now coming in freely, and operations of mills are on a heavier basis than for three or four months. The leading interest operated last week to over 85 per cent. of capacity. The Pope works of the Phillips Sheet & Tin Plate Company at Steubenville, Ohio, which has been idle for some time on account of labor troubles, is being put in shape and probably will be started within a few weeks. Specifications against contracts forterne plate are coming in freely. The general outlook for the tin plate trade is better than for some time. The nominal price of 100 lb. cokes is \$3.40 and 100 lb. ternes \$3.30.

Shafting.—Makers report conditions better in the shafting trade. Some large contracts have been placed recently for first quarter and first half. Specifications against contracts are coming in a little better. The tone of the market is stronger. We quote cold-rolled shafting in carload and larger lots at 64 per cent. off and in small lots from 60 to 63 per cent. off, depending on the order, delivered in base territory. It is stated that the quotation of 65 per cent. off for desirable orders has practically entirely disappeared.

Bolts and Rivets.—The demand for rivets is more active. Jobbers and consumers of nuts and bolts are placing orders more freely than for some time. While the tone of the market is stronger, prices are not any higher. We quote button-head structural rivets at \$1.65 to \$1.70 and cone-head boiler rivets at \$1.75 to \$1.80, in carload lots, an advance of \$2 to \$3 a ton over these prices being charged for small lots, depending on the order. Terms are 30 days net, less 2 per cent. for cash in 10 days. Discounts on nuts and bolts, which are being more or less shaded, are as follows in lots of 300 lb. or over, delivered within a 20c. freight radius of makers' works.

Coach and lag screws.....	80 and 20% off
Small carriage bolts, cut threads.....	75 and 17 1/2% off
Small carriage bolts, rolled threads.....	80 and 2 1/2% off
Large carriage bolts.....	70 and 15% off
Small machine bolts, cut threads.....	80 and 2 1/2% off
Small machine bolts, rolled threads.....	80 and 7 1/2% off
Large machine bolts.....	75 and 10 and 2 1/2% off
Machine bolts, C.P.C. & T nuts, small.....	70 & 12 1/2% off
Machine bolts, C.P.C. & T nuts, large.....	70 & 12 1/2% off
Square h.p. nuts, blanked and tapped.....	\$6.00 off list
Hexagon nuts.....	\$6.70 off list
C.P.C. & R sq. nuts, blanked and tapped.....	\$5.80 off list
Hexagon nuts, 3/4 and larger.....	\$6.80 off list
Hexagon nuts, smaller than 9/16.....	\$7.40 off list
C.P. plain square nuts.....	\$5.30 off list
C.P. plain hexagon nuts.....	\$5.70 off list
Semi-fn. hex. nuts, 3/4 and larger.....	85 and 10% off
Semi-fn. hex. nuts, smaller than 9/16.....	85, 10 & 5% off
Rivets, 7/16 x 6 1/2, smaller and shorter.....	80 and 10% off
Rivets, metallic tinned, bulk.....	80 and 10% off
Rivets, tin plated, bulk.....	80 and 10% off
Rivets, metallic tinned, packages.....	80 and 10% off
Standard cap screws.....	75, 10, 10 and 7 1/2% off
Standard set screws.....	75, 10, 10 and 7 1/2% off

Hoops and Bands.—Consumers are of the opinion that prices are not likely to go lower and are placing orders more freely. We quote steel bands at 1.20c., with extras as per the steel bar card, and steel hoops at 1.35c., maker's mill.

Wire Products.—The announcement made last week by the American Steel & Wire Company that it had withdrawn all quotations on wire products has had a beneficial effect. In the past week some good-sized contracts for wire nails and wire for delivery over the next 60 days or longer have been placed on the basis of \$1.55 for wire nails. The new prices are now regarded as minimum of the market, it being stated that all the wire mills are adhering rigidly to them. We quote wire nails to jobbers at \$1.55; cut nails, \$1.55; annealed wire, \$1.35; galvanized barb wire and fence

staples, \$1.95; painted barb wire, \$1.55, f.o.b., Pittsburgh, per 100 lb., usual terms, actual freight added to point of shipment. We quote woven wire fencing at 74 1/2 per cent. off in carload lots; 73 1/2 per cent. off on 1000-rod lots, and 72 1/2 per cent. on less than 1000-rod lots, all f.o.b., Pittsburgh.

Railroad Spikes.—Fairly heavy inquiries are in the market but are slow in being closed up. This is likely largely due to the fact that some makers are refusing to sell for delivery over the entire year at present prices. None of the spike mills is running to full capacity, as there is not enough new business being placed to allow full operations. We quote railroad spikes in large lots at \$1.45 and in carloads at \$1.50; small railroad and boat spikes, \$1.55 per 100 lb., f.o.b., Pittsburgh.

Merchant Steel.—The new demand continues quiet, and is mostly for small lots to cover current needs. Jobbers and consumers are slow to place contracts, not being satisfied that prices are as low as they will go. Nominal prices on small lots are as follows: Iron finished tire, 1/2 x 1 1/2 in., and larger, 1.35c., base; under 1/2 x 1 1/2 in., 1.50c.; planished tire, 1.55c.; channel tire, 3/4 to 1 in., 1.85c. to 1.95c.; 1 1/2 in. and larger, 1.95c.; toe calk, 1.95c. to 2.05c., base; flat sleigh shoe, 1.70c.; concave and convex, 1.75c.; cutter shoe, tapered or bent, 2.25c. to 2.35c.; spring steel, 1.95c. to 2.05c.; machinery steel, smooth finish, 1.80c. We quote cold-rolled strip steel as follows: Base rates for 1 in. and 1 1/2 in. and wider, under 0.20 carbon, and No. 10 and heavier, hard temper, 3.25c.; soft, 3.50c.; coils, hard, 3.15c.; soft, 3.40c.; freight allowed. The usual differentials apply for lighter sizes.

Standard Pipe.—The new demand for butt and lap weld pipe continues more active than usual at this season, and the mills are said to be operating from 75 to 80 per cent. of capacity. The Philadelphia Company of this city is in the market for about 12,000 tons of iron and steel pipe and oil well supplies for shipment through the first half, and this business is likely to go to local mills. It is said that other large consumers will come in the market before long for their requirements of iron and steel pipe and oil well goods for delivery over the first half. Discounts on iron and steel pipe are said to be fairly well maintained.

Boiler Tubes.—Makers of charcoal-iron boiler tubes have made the same reductions in prices as were made on lap-welded steel tubes, and which went into effect on January 2. On all sizes of standard charcoal iron tubes up to 3 in., and from 5 up to 13 in., discounts have been increased one point, or a reduction of \$2 a ton, while on 3 up to 4 1/2 in., discounts were increased two points, or a reduction of \$4. These lower prices also went into effect on January 2, and were brought about by the fact that the former discounts were not maintained. It is expected that the demand will now show betterment, and that the market will be more stable.

Coke.—Two independent blast furnace companies are in the market for a considerable tonnage for delivery over the first half, one inquiring for 40,000 to 50,000 tons a month and the other for about 30,000 tons a month. It is stated that one of them has offered \$1.75 for standard Connellsville coke for delivery over first half and that unless it can buy at this figure it will blow out its furnaces. A Shenango Valley furnace interest is in the market for about 10,000 tons per month, over first half, but has postponed buying. The coke market at present is in a waiting attitude, as the furnace companies that have not covered are refusing to pay \$2, while, on the other hand, high grade makes of furnace coke can be had at less than this price. We note, however, that a local interest has sold upward of 100,000 tons of coke per month over first half at prices ranging from \$1.85 to \$1.90, and is still offering standard blast furnace coke for first half delivery at \$1.90 per net ton at oven. A large consumer of foundry coke has refused to pay present prices and has bought 3000 to 4000 tons for January delivery at \$2.50 per net ton at oven. We quote strictly high grade blast furnace coke for first half delivery at \$2 per net ton at oven, but some standard grades can still

be bought at \$1.85 to \$1.90. We quote standard makes of 72-hr. foundry coke at \$2.50 to \$2.75 to consumers, per net ton at oven. We note sales of 4000 to 5000 tons for January shipment at the lower price. The Connellsville Courier reports the output of coke last week in the Upper and Lower Connellsville regions as 252,151 net tons, an increase over the previous week of about 16,000 tons.

Old Material.—There has been a distinct improvement in the scrap trade, particularly in scrap used for steel making. Prices on selected heavy steel scrap, borings and turnings have advanced about 50c. a ton, and it is said that selected steel scrap has sold as high as \$11.25 to \$11.50, delivered at buyer's mills. It is claimed that stocks held by consumers have been considerably reduced, and dealers are not inclined to sell short for fear the market will still further advance. Some local dealers are of the opinion that the attempt being made to form a dealers' association will not be successful. One leading scrap concern has positively refused to become identified with it and several others have made conditions under which they will join that would seem prohibitive. We note sales of 3000 to 4000 tons of heavy steel scrap at prices ranging from \$10.75 to \$11.25 per gross ton, delivered at buyers' mill, but it is doubtful whether it could be picked up at present for less than \$11.25, delivered. We also note sales of 700 to 800 tons of turnings at \$7.25, and 1000 to 1200 tons of borings at \$8.25, delivered at consumers' mills. Dealers are quoting about as follows per gross ton for delivery in the Pittsburgh and other districts:

Selected heavy steel scrap, Steubenville, Follansbee, Brackenridge, Sharon, Monessen, Midland and Pittsburgh delivery	\$11.00 to \$11.25
Compressed side and end sheet scrap	9.75 to 10.00
No. 1 foundry cast	10.75 to 11.00
No. 2 foundry cast	9.75 to 10.00
Bundled sheet scrap, f.o.b. consumers' mills, Pittsburgh district	6.75 to 7.00
Rerolling rails, Newark and Cambridge, Ohio, Cumberland, Md., and Franklin, Pa.	13.00 to 13.25
No. 1 railroad malleable stock	11.25 to 11.50
Grate bars	7.50 to 7.75
Low phosphorus melting stock	14.00 to 14.25
Iron car axles	24.25 to 24.75
Steel car axles	17.25 to 17.50
Locomotive axles, steel	20.75 to 21.25
Locomotive axles, iron	25.25 to 25.75
No. 1 busheling scrap	10.25 to 10.50
No. 2 busheling scrap	6.25 to 6.75
*Machine shop turnings	7.25 to 7.50
*Old car wheels	11.75 to 12.00
*Cast-iron borings	8.00 to 8.25
†Sheet bar crop ends	13.50 to 13.75
Old iron rails	14.25 to 14.50
No. 1 railroad wrought scrap	13.50 to 13.75
Heavy steel axle turnings	8.75 to 9.00
Stove plate	7.50 to 7.75

*These prices are f.o.b. cars at consumers' mills in the Pittsburgh district.
†Shipping point.

Chicago

CHICAGO, ILL., January 14, 1914.—(By Telegraph.)

The withdrawal of minimum quotations for plates, shapes and bars by some of the Eastern mills and the establishment of 1.15c. and 1.20c., Pittsburgh, as minimum quotations by one of the Western mills, following the taking of a round tonnage at a concession, reflect the turn of the tide in this market. The buying of steel occasioned by the already developed demands of consumption has brought a very considerable tonnage to the mills but the important factor in the buying of the past 10 days has been the replenishing of stocks by jobbers and fabricators. This covering of anticipated requirements is commonly taken as an acceptance of current prices as the low point. The low prices for prompt shipment wire products have also disappeared with the withdrawal of outstanding quotations. The buying of track supplies was noteworthy during the week, and the inquiries for cars assumed proportions of increased importance. Pig-iron activity is practically unabated, and with from 60,000 to 70,000 tons placed on their books within a fortnight, local furnaces are still figuring on at least 15,000 tons. Buyers of Southern iron are also beginning to appear. The local market for scrap is responding to the influences that have been making for higher prices, and buying is becoming freer at the advance.

Pig Iron.—The very active buying of pig iron in this market during the past two weeks seems not to have exhausted the situation, and the beginning of another week finds from 15,000 tons to 20,000 tons in moderate sized lots still under negotiation. A conservative estimate of the tonnage closed since January 1 would not place the total at less than 60,000 tons, and with this business on the books the furnaces are assuming a somewhat stiffer front than was true of the earlier campaign for orders. The larger portion of the current business is being placed at prices approximating \$14.50, although \$14 at the furnace is still an open quotation. Sales of Southern iron were more numerous, one interest moving 4500 tons at a price stated to be \$11, Birmingham, for first half delivery. Other Southern iron for March, April and May delivery brought \$10.75 for No. 2. For shipment in the first quarter \$10.50 continues to be the minimum quotation. A part of the inquiry still remaining covers high silicon irons for which the local price, as determined by recent sales, appears to be \$18.40, Chicago, for 8 per cent. A number of sales of charcoal iron in Wisconsin and Michigan are reported, from which it is evident that prices have not added very much to their strength since midsummer. The following quotations are for iron delivered at consumers' yards, except those for Northern foundry, malleable Bessemer and basic iron, which are f.o.b. furnace and do not include a local switching charge averaging 50c. a ton:

Lake Superior charcoal, Nos. 1, 2, 3, 4	\$15.25 to \$15.75
Northern coke foundry, No. 1	14.50 to 15.00
Northern coke foundry, No. 2	14.00 to 14.50
Northern coke foundry, No. 3	13.50 to 14.00
Southern coke No. 1 f'dry and 1 soft	15.35 to 15.85
Southern coke, No. 2 f'dry and 2 soft	14.85 to 15.35
Southern coke, No. 3	14.35 to 14.85
Southern coke, No. 4	13.85 to 14.35
Southern gray forge	13.85 to 14.35
Southern mottled	13.35 to 13.85
Malleable Bessemer	14.00 to 14.50
Standard Bessemer	17.65
Basic	13.50 to 14.00
Jackson Co. and Kentucky silvery, 6 per cent.	17.40
Jackson Co. and Kentucky silvery, 8 per cent.	18.40
Jackson Co. and Kentucky silvery, 10 per cent.	19.40

(By Mail)

Rails and Track Supplies.—The past week has been featured by the placing of a contract by one of the Western trunk lines for its yearly requirements of tie plates, which will be 10,000 to 12,000 tons. Liberal buying of spikes is reported. No further developments in rail buying came to the surface, the activity in the purchase of track fastenings being accessory to rail contracts already placed. We quote standard railroad spikes at 1.50c. to 1.55c., base; track bolts with square nuts, 2.05c. to 2.10c., base, all in carload lots, Chicago; tie plates, \$27 to \$28 net ton; standard section Bessemer rails, Chicago, 1.25c., base; open hearth, 1.34c.; light rails, 25 to 45 lb., 1.25c.; 16 to 20 lb., 1.30c.; 12 lb., 1.35c.; 8 lb., 1.40c.; angle bars, 1.50c., Chicago.

Structural Material.—Inquiry and buying have been especially active in this branch of trade, the indications of returning strength in the steel market having been conspicuous. Some of the Eastern mills have announced the withdrawal of quotations at 1.15c. and 1.20c., advancing their prices \$1 a ton, while certain Western mills, having accumulated a foundation of orders for prompt shipment at prices understood to approximate 1.28c., Chicago, are now on the basis of 1.38c. There has been a liberal buying of structural material for stock, shipments to be made in the first quarter. Contracts secured for fabricated steel were of less importance last week, the aggregate tonnage being under 1500. We quote for Chicago delivery from mill, prompt shipment, 1.38c. to 1.43c.

Jobbers have been active in covering their own requirements for stock. Sales have been for the most part of routine character. We quote for Chicago delivery from store 1.75c.

Plates.—While there is still some doubt regarding the actual placing of orders for cars by the Union Pacific, though the accepted distribution of at least a part of the order to the Bettendorf Axle Company and the Pullman Company points in that direction, there is no doubt that the original intent to purchase 5000 cars has now been extended to provide for 12,000. Other car business includes an inquiry for 110 passenger coaches for the Great Northern, 150 refrigerator cars for the Illinois Central, 1000 cars for the Toledo.

St. Louis & Western and the purchase of 200 cars each by Morris & Co. and Swift & Co., Chicago. Prices for plates from mill show greater firmness, although it cannot be said that 1.15c., Pittsburgh, has entirely disappeared. For the average contract inquiry covering a moderate tonnage, of which there is no small number pending, the quotation is 1.38c., Chicago. Sufficient tonnage has been placed under contract for first quarter delivery to establish the mills in a much more comfortable position. The mill at Indiana Harbor has this week 11 out of its 12 open-hearth furnaces in operation. We quote for Chicago delivery, for prompt shipment from mill, 1.33c. to 1.38c.

For Chicago delivery from jobbers' stocks we continue to quote 1.75c.

Sheets.—With tonnage continuing to come out in substantial volume, additional strength is added to the local situation by reason of the restricted operations of one of the Chicago mills, a part of which is down during the installation of a new drive. Prices are as yet unchanged, but improvement appears imminent, not alone because of better market conditions for the finished product, but also because of the activity in semi-finished steel. We quote for Chicago delivery from mill: No. 10 blue annealed, 1.68c. to 1.73c.; No. 28 black, 2.03c. to 2.08c.; No. 28 galvanized, 3.03c. to 3.08c.

For sheets out of store we quote for Chicago delivery as follows, minimum prices applying on bundles of 25 or more: No. 10 blue annealed, 1.95c.; No. 28 black, 2.45c. to 2.55c.; No. 28 galvanized, 3.50c. to 3.60c.

Bars.—The disposition of consumers of steel to get under cover has extended to steel bars as well as their other requirements. At Chicago very attractive business fails to bring out better than 1.15c., and quotations from some of the Eastern mills are \$1 a ton higher. A stronger market also prevails with respect to bar iron, although tonnage is not appearing very freely. Minimum quotations during the week found bottom at 1.12½c., Chicago. Additional mill capacity rolling hard steel was placed in operation beginning this week. Some new business has been placed on the books, a part of it in the neighborhood of 1.30c. at the mill. We quote for mill shipment as follows: Bar iron, 1.12½c. to 1.15c.; soft steel bars, 1.33c.; hard steel bars, 1.30c.; shafting in carloads, 65 per cent. off; less than carloads, 60 per cent. off.

We quote above prices for Chicago delivery: Soft steel bars, 1.65c.; bar iron, 1.65c.; reinforcing bars, 1.65c. base, with 5c. extra for twisting in sizes ½ in. and over, and usual card extras for smaller sizes; shafting 57 per cent. off.

Rivets and Bolts.—Benefiting by the better conditions obtaining throughout the market, a more healthy tone is observed in the inquiry for rivets and bolts. The market is still one of nominal prices, quotations varying with the individual transaction. We quote from mill as follows: Carriage bolts up to ¾ x 6 in., rolled thread, 80-12½; cut thread, 80-5; larger sizes, 75-10; machine bolts up to ¾ x 4 in., rolled thread, 80-15; cut thread, 80-10; large size, 75-15; coach screws, 80-15-10; hot pressed nuts, square head \$6.20 off per cwt.; hexagon, \$7.00 off per cwt. Structural rivets, ½ to 1¼ in., 1.88c., base, Chicago, in carload lots; boiler rivets, 10c. additional.

Out of store we quote for structural rivets, 2.40c., and for boiler rivets, 2.60c. Machine bolts up to ¾ x 4 in., 70-10-10; larger sizes, 70-12½; carriage bolts up to ¾ x 6 in., 75-10; larger sizes, 70-12½ off. Hot pressed nuts, square head, \$5.50, and hexagon, \$6.20 off per cwt.

Wire Products.—With the withdrawal of all outstanding quotations by the leading interest, an action in which other makers generally participated, the price of 1.55c., Pittsburgh, appears to have been restored as the minimum. With the disappearance of some of the irregularities, an increased assurance among buyers is noted and a beginning of stock up-building is reflected in the trade of the past week. We quote to jobbers as follows: Plain wire, No. 9 and coarser, base, \$1.53; wire nails, \$1.73; painted barb wire, \$1.73; galvanized, \$2.10; polished staples, \$1.73; galvanized, \$2.10, all Chicago.

Cast-Iron Pipe.—The opening of bids at St. Paul for about 4000 tons occurred Monday but no report as to the successful bidder has been received. At Chicago an award of 5200 tons of pipe in sizes from 6 to 12 in. is scheduled for January 20. The buying of pipe for

municipal installation is still somewhat tardy. We quote as follows, per net ton, Chicago: Water pipe, 4 in., \$27; 6 to 12 in., \$25; 16 in. and up, \$24, with \$1 extra for gas pipe.

Old Material.—The campaign for higher prices being waged in the local scrap market has this past week achieved more tangible results. With scrap moving from Chicago to consumers in Ohio and other points east of the local market at advances over the prices which melters here seemed willing to pay, local consumers have found it necessary to modify their views to an extent represented by an average advance of about 25c. per ton. Prices paid for scrap recently sold by the railroads were generally at least 50c. a ton above our quotations. Melter, however, are not yet buying freely and there is still considerable idle mill capacity. New railroad offerings of scrap are limited to a small list from the Union Pacific and about 2500 tons from the Minneapolis, St. Paul & Sault Ste. Marie. We quote for delivery at buyers' works, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton	
Old iron rails	\$13.00 to \$13.50
Old steel rails, rerolling	11.00 to 11.50
Old steel rails, less than 3 ft.	10.25 to 10.75
Relaying rails, standard section, subject to inspection	24.00
Old carwheels	11.50 to 12.00
Heavy melting steel scrap	9.25 to 9.75
Frogs, switches and guards, cut apart	9.25 to 9.75
Shoveling steel	8.00 to 8.50
Steel axle turnings	6.50 to 7.00

Per Net Ton	
Iron angles and splice bars	\$12.00 to \$12.50
Iron arch bars and transoms	12.00 to 12.50
Steel angle bars	8.25 to 8.75
Iron car axles	17.25 to 17.75
Steel car axles	12.00 to 12.50
No. 1 railroad wrought	8.75 to 9.00
No. 2 railroad wrought	8.25 to 8.50
Cut forge	8.25 to 8.50
Steel knuckles and couplers	8.75 to 9.25
Steel springs	9.25 to 9.75
Locomotive tires, smooth	10.50 to 11.00
Machine shop turnings	4.25 to 4.50
Cast borings	4.25 to 4.75
No. 1 busheling	7.50 to 8.00
No. 2 busheling	6.25 to 6.75
No. 1 boilers, cut to sheets and rings	6.00 to 6.50
Boiler punchings	9.50 to 10.00
No. 1 cast scrap	10.25 to 10.75
Stove plate and light cast scrap	9.25 to 9.75
Grate bars	8.50 to 9.00
Railroad malleable	9.50 to 9.75
Agricultural malleable	8.25 to 8.75
Pipes and flues	6.75 to 7.25

Philadelphia

PHILADELPHIA, PA., January 13, 1914.

A larger volume of business has been done in foundry grades of pig iron, largely at the expense of prices, in which Buffalo iron figured to a considerable extent. Following the withdrawal of low quotations, the tone of the market improved and producers now look for a rebound from the extreme low figures. Cast-iron pipe makers have made purchases and are expected to be more extensive buyers. Producers and consumers of steel billets are still deadlocked on the question of prices. The demand for heavy steel plates continues fairly good, but in other classes of rolled products is irregular; prices, however, are a trifle firmer. A broker's market has developed in heavy melting steel scrap, but in rolling mill grades consumers are showing more interest.

Iron Ore.—Little interest is being taken in the market, although occasional cargoes of foreign ore, not up to contract standard, have been moved at bargain prices. Importations during the week ended January 10 included 4650 tons from Cuba, 2400 tons from Venezuela and 11,933 tons from Sweden.

Pig Iron.—From the standpoint of volume, business in foundry grades has been decidedly better, but prices have suffered. Buffalo iron figured largely in the week's transactions. Sales were mostly in moderate lots, for first quarter, at prices down to \$14.45, delivered, for No. 2X. After disposing of a good part of their first quarter output some of the Buffalo interests withdrew low quotations and advanced prices to \$13, Buffalo, equal to \$15.45 delivered here. Some eastern Pennsylvania producers met this competition and made extensive sales for delivery over the next three months.

at prices ranging from \$14.75 down to \$14.50 for No. 2X and down to \$14.25, delivered, for No. 2 plain. At the same time individual producers held at \$15.25, \$15 and \$14.85, delivered, for No. 2X foundry, and made occasional sales at those figures. Soil-pipe makers, stove foundries and general jobbing foundries bought extensively on this movement, although but in few cases was the customary full quarter's tonnage taken. A number of consumers would have purchased for a part of their first half requirements, but few sellers are willing to make sales covering an extended period at current prices. Weakness and uncertainty surround prices of Virginia foundry grades. Sales have been principally in moderate lots, with general quotations at \$12.75 at furnace for No. 2X. Reports are current that this price can be shaded 25c. a ton for some brands, while others make no concessions, holding 2X and lower grades at the same basis. Cast-iron pipe makers in this district have been active buyers of both standard and low-grade iron. It is stated that the purchases of the leading interest will ultimately exceed, rather than be below, the estimated 60,000 tons to cover the requirements of its various plants. Low-grade iron has been sold to pipe foundries in this district at \$14, delivered at Delaware River points. Rolling-mill forge iron has been somewhat more active. An Eastern mill is credited with purchases of several thousand tons at \$14, delivered, while smaller sales were made on about the same basis. Basic iron has been quiet. Sales of standard low phosphorus aggregating several thousand tons have been made at \$21 to \$21.25, delivered, and a fair tonnage is still pending. Inquiry is also before the trade for 1000 tons of Lebanon Valley low phosphorus iron. There has been no movement in foreign low phosphorus pig. General inquiry for standard brands of foundry iron is comparatively good, although few large tonnages have come out. An inquiry for several hundred tons of malleable foundry for prompt delivery is noted. Quotations, owing to the firmness maintained by some furnaces, show a somewhat wider range, the following being named for deliveries in buyers' yards in this vicinity:

Eastern Penn. No. 2 X foundry.....	\$14.50 to \$15.00
Eastern Pennsylvania No. 2 plain....	14.25 to 14.75
Virginia No. 2 X foundry.....	15.55 to 16.00
Virginia No. 2 plain.....	15.30 to 15.50
Gray forge	14.00 to 14.25
Basic	14.00 to 14.25
Standard low phosphorus	21.00 to 21.25

Ferroalloys.—Following small sales of 80 per cent. ferromanganese, made just after the price reduction last week, business has been practically at a standstill. One or more carloads are reported sold at \$45, sea-board. Little further is heard here of competition on the part of domestic ferromanganese. Ferrosilicon remains quiet. Importations last week included 150 tons of German and 115 tons of English ferromanganese.

Billets.—The situation is decidedly unsatisfactory to producers. Consumers who have been in the market for tonnage show less disposition to close, holding one for concessions, which mills refuse to grant. The Alan Wood Iron & Steel Company's plant at Ivy Rock is still idle, although it is probable that the blooming mill will resume next week on an 8-hr. per day basis, to take care of an accumulation of small orders. Producers are holding at \$22.40 delivered for small orders on basic open-hearth rolling billets, but would accept \$21.50 on round lots. Forging billets remain quiet and are nominally quoted at \$4 to \$5 advance over rolling billets, dependent on specifications.

Plates.—Eastern makers maintain optimistic views of the situation. Current miscellaneous orders continue fair and some good first quarter contracts have been entered, a few individual orders covering 800 to 1200 tons, mostly tank plates. Mill operations now range from 50 to 60 per cent., while orders coming in promise a better rate. It is stated that the contracts for plates and shapes, some 4000 tons, for a Standard Oil Company tank steamship, have not yet been placed. There appears to be more firmness in prices, 1.35c. to 1.40c., delivered here, according to the nature of the order, representing the market for prompt or first quarter shipment. Some mills ask \$1 advance for second quar-

ter, although few are willing to accept flat second quarter business.

Structural Material.—A better volume of moderate lot business in fabricated material has been coming out. Fabricators have taken several orders for bridges from various railroads, ranging from 200 to 300 tons of material. An Eastern mill is credited with an order for bridge work aggregating 6000 tons for a railroad up the State. Several small building propositions, ranging up to 200 tons, have been closed. Miscellaneous business has been a shade better, but the aggregate tonnage coming to the mills is still far below normal, and hence mill operations continue irregular. Prices of plain material have a somewhat stronger appearance, mills quoting from 1.35c. to 1.40c., delivered here, for ordinary plain shapes.

Sheets.—Eastern mills continue to operate at full capacity, but have little forward business on their books. Rolling schedules rarely cover more than a few days ahead, but there is a constant demand for small prompt lots which is sufficient to keep mills running. While consumers continue to make efforts to get lower prices and unconfirmed reports of 1.35c., Pittsburgh, are heard on Western sheets, Eastern mills, making smooth, loose-rolled sheets, experience no difficulty in obtaining 1.55c. to 1.60c., delivered here, for No. 10 blue annealed.

Bars.—Eastern iron bar makers report a fair demand but the business offered is usually in small lots. Competition is sharp but no further price concessions have been noted. Common iron bars are available on desirable specifications at 1.20c. here, but current small business usually commands 1.22½c. to 1.27½c. delivered. A moderate demand for steel bars continues, with prices at 1.35c. to 1.40c. according to specification.

Coke.—Less activity is noted in both furnace and foundry grades. Furnace coke is held at about \$2 at oven for forward and \$1.85 to \$1.90 for prompt delivery. Foundry coke buyers show less interest in the market, and it is more difficult to get top prices. The following range of prices is named, per net ton, for deliveries in buyers' yards in this vicinity:

Connellsville furnace coke	\$3.90 to \$4.40
Connellsville foundry coke	4.90 to 5.25
Mountain furnace coke	3.60 to 4.10
Mountain foundry coke	4.60 to 4.95

Old Material.—Sentimentally the market is stronger, although in some grades transactions are almost entirely between dealers. In few instances are consumers of heavy meeting steel in the market, although some quiet interest is developing. Dealers pay up to \$10.25 delivered for No. 1 steel and even higher prices were realized on the railroad lists. Rolling mills have been more active buyers and in instances have paid slightly higher than recent quotations for some grades. Railroad wrought has been sold at \$13, delivered, while \$9.25 is offered by some buyers of railroad grates and stove plate. The following quotations about represent the market for deliveries in buyers' yards in this district, covering eastern Pennsylvania and taking freight rate varying from 35c. to \$1.35c per gross ton:

No. 1 heavy melting steel.....	\$10.00 to \$10.50
Old steel rails, rerolling (nominal)...	12.25 to 12.50
Low phosphorus heavy melting steel	
scrap (nominal)	14.00 to 14.50
Old steel axles (nominal).....	15.50 to 16.00
Old iron axles (nominal).....	21.00
O'd iron rails (nominal).....	15.50
Old carwheels	12.00 to 12.50
No. 1 railroad wrought	13.00 to 13.25
Wrought-iron pipe	9.00 to 9.50
No. 1 forge fire	8.00 to 8.50
No. 2 light iron (nominal).....	5.00
No. 2 busheling (nominal)	8.00 to 8.50
Wrought turnings	7.00 to 7.50
Cast borings	7.50 to 8.00
Machinery cast	12.00 to 12.50
Grate bars, railroad	9.25 to 9.75
Stove plate	9.25 to 9.75
Railroad malleable (nominal)	9.00 to 9.50

Two grades of coke are made in China—foundry and smelting. The first contains of fixed carbon 87.94 per cent.; ash, 10.94 per cent.; sulphur, 0.506 per cent. The smelting brand analyzes: Fixed carbon, 88.06 per cent.; ash, 11.10 per cent.; sulphur, 0.618 per cent. These cokes are made at the modern coke oven plant at Tongshan, the removal of which to the vicinity of the Hankow blast furnaces has recently been proposed.

Cincinnati

CINCINNATI, OHIO, January 14, 1914.—(By Telegraph.)

Pig Iron.—There is a continued fair inquiry for foundry iron, and sales of moderate volume have been made. The general undercurrent of feeling is more optimistic, although neither buyers nor sellers anticipate any sudden change in present conditions. The purchase of basic by a nearby steel company, reported last week, while not directly affecting the foundry iron market, has tended to encourage the trade. It is also rumored that a considerable quantity of Southern iron was contracted for by a leading pipe manufacturer within the past few days. A local firm has bought 500 tons of No. 3 foundry iron, and two Southern Ohio melters booked approximately the same tonnage of No. 2 foundry, all to be shipped from Southern furnaces and for first half delivery. An Indiana consumer purchased 500 tons of Northern No. 2 foundry at \$13, Ironton, which is the prevailing price for either prompt or first half shipment. A central Indiana melter is also reported to have taken 1200 tons of iron, divided between Northern and Southern brands. Southern iron is quoted at \$10.75 to \$11, Birmingham, for first quarter. For first half the last named price is considered minimum. Northern iron remains at \$13, Ironton, for any shipment until July 1, although for immediate delivery this price is said to have been shaved a few cents. However, in the deals involved special conditions prevailed. Malleable is still quiet, and no open inquiries have been lately issued: Based on freight rates of \$3.25 from Birmingham and \$1.20 from Ironton we quote f.o.b. Cincinnati, as follows:

Southern coke, No. 1 f'dry and 1 soft.	\$14.50 to \$15.00
Southern coke, No. 2 f'dry and 2 soft.	14.00 to 14.50
Southern coke, No. 3 foundry.	13.50 to 14.00
Southern, No. 4 foundry	13.00 to 13.50
Southern gray forge	12.50 to 13.00
Ohio silvery, 8 per cent. silicon.	17.70 to 18.20
Southern Ohio coke, No. 1.	15.20 to 15.70
Southern Ohio coke, No. 2.	14.20 to 14.70
Southern Ohio coke, No. 3.	13.95 to 14.20
Southern Ohio malleable Bessemer.	14.20 to 14.70
Basic, Northern	14.20 to 14.70
Lake Superior charcoal	16.25 to 17.25
Standard Southern carwheel	27.25 to 27.75

(By Mail)

Coke.—Quotations on Connellsville furnace and foundry coke are much firmer, and on leading 48-hr. brands \$2 per net ton at oven is the minimum on both prompt and first half shipment. Southern Ohio consumers, who were in the market, have covered for a six months' supply. Foundry coke is being bought in small quantities, but the stiffening of prices is expected to interest foundrymen to the extent of contracting ahead. We quote Connellsville furnace coke for either prompt or first half shipment at \$2 per net ton at oven, and foundry grades from \$2.50 to \$2.75. Wise County and Pocahontas furnace coke prices are from 10c. to 20c. a ton higher, but the 72-hr. product is now about on the same level with Connellsville quotations. Both labor and empty cars are reported to be in plentiful supply in all three fields.

Finished Material.—There is a much more hopeful feeling. Buying is confined to material for prompt shipment, as neither the mills nor the warehouses are desirous of booking business at present quotations, except for immediate requirements. It is stated that if the mills were willing to book ahead at present prices there would be no trouble in taking on a large tonnage, as customers are generally of the opinion that the bottom has been reached. Both black and galvanized sheets are showing considerable strength, although quotations are unchanged this week on No. 28 black sheets at 2c. to 2.05c. and on galvanized 3.05c., f.o.b. cars Cincinnati, or Newport, Ky. Steel bars are quoted, from warehouse stocks, at 1.75c. and structural shapes, cut to lengths, when desired, at 1.85c. The severe cold weather prevailing has cut down the demand for structural material.

Old Material.—The general sentiment shows considerable improvement, and prices have advanced all along the line about 25c. a ton. The rolling mills have bought considerable scrap lately, and the foundries also show some signs of being willing to contract for future

needs. The minimum figures given below represent what buyers are willing to pay for delivery in their yards, southern Ohio and Cincinnati, and the maximum quotations are dealers' prices f.o.b. at yards:

Per Gross Ton	
Bundled sheet scrap	\$6.25 to \$6.75
Old iron rails	10.75 to 11.75
Relaying rails, 50 lb. and up.	19.50 to 20.00
R-rolling rails, steel.	10.75 to 11.25
Melting steel rails.	9.00 to 9.50
Old carwheels	10.00 to 10.50

Per Net Ton	
No. 1 railroad wrought.	\$8.25 to \$8.75
Cast borings	4.25 to 4.75
Steel turnings	4.25 to 4.75
No. 1 cast scrap	8.50 to 9.00
Burnt scrap	5.75 to 6.25
Old iron axles	15.75 to 16.25
Locomotive tires (smooth inside)	9.50 to 10.00
Pipes and flues	5.50 to 6.00
Malleable and steel scrap.	6.50 to 7.00
Railroad tank and sheet scrap.	4.25 to 4.75

Cleveland

CLEVELAND, OHIO, January 13, 1914.

Iron Ore.—In 1913 Lake ship yards, exclusive of Canadian yards, launched 32 vessels, of which four were bulk freighters. For 1914 delivery Lake ship yards have under contract 27 vessels, seven of which are bulk freighters. These seven freighters will have a carrying capacity of 67,000 gross tons on a single trip, but two of them are being built in Canadian yards and will not be available for the ore trade of the Great Lakes. New ore carrying capacity during 1914 will amount to about 45,000 tons per trip. The loss of vessels in storms during 1913 amounted to about 93,000 tons so that if all the new boats are ready to go into commission the available carrying capacity of the fleet at the opening of navigation will be about 50,000 tons less than it was at the beginning of 1913. No additional contracts for American built boats for next season's delivery are in prospect. Ore shipments from the docks continue very light. Prices for 1914 are as yet being given little consideration. We quote 1913 prices as follows: Old range Bessemer, \$4.40; Mesaba Bessemer, \$4.15; old range non-Bessemer, \$3.50; Mesaba non-Bessemer, \$3.40.

Pig Iron.—The market is quite active. A fairly heavy tonnage has been sold in the past few days for first half delivery. The sales include several round lots of foundry and malleable iron and some basic, these lots ranging up to 4000 tons. Most of the sales reported were for shipment outside of the Cleveland territory. A number of foundry iron inquiries are pending, including one from Massillon for 600 tons of analysis iron and one from Mansfield for 1200 tons, both for the first half delivery. Local prices are slightly firmer. One seller who has been quoting No. 2 foundry at \$13.25, delivery Cleveland, is now naming \$13.50 as its minimum delivery price. In the Valley some quotations as low as \$12.50 have been made, but most producers are asking from \$12.75 to \$13. There is a better inquiry for Southern iron and prices are firm at \$10.75 to \$11, Birmingham, for No. 2, \$10.50 Southern iron apparently having entirely disappeared. Lower prices are being quoted on Ohio silvery iron. On small lots the quotation is \$16.50 at furnace, but it is probable that \$16 can be done on good sized inquiries. However, we note the sale of a round lot at \$16.25 for 8 per cent. silicon to a Cleveland consumer for the first half. The Cleveland Furnace Company blew out one of its stacks January 11. None of the furnaces of Corrigan, McKinney & Co. has as yet been blown out. We quote, delivered Cleveland, as follows:

Bessemer	\$15.15
Basic	13.00
Northern No. 2 foundry	13.50
Southern No. 2 foundry	\$15.10 to 15.35
Jackson Co. silvery, 8 per cent. silicon	17.80 to 18.10

Coke.—A local furnace interest reports that it has been able to secure some additional furnace coke for early shipment at \$1.75 per net ton at oven. Quotations generally, however, are \$1.90 to \$1.95 for spot shipment and \$1.95 to \$2 for contract. The demand for foundry grades is not active. While foundry coke

is quoted at \$2.50 to \$2.75 per net ton at oven, it is claimed that little good coke can be had under about \$2.60.

Finished Iron and Steel.—The improvement in the demand in finished lines continues. Not only is there considerable contracting, but mill agencies are getting a good volume of orders accompanied by specification. The demand for steel bars is particularly active. Steel bars and structural material are quoted at 1.20c., Pittsburgh, for prompt shipment and this price is being maintained by the larger mills for plates. Some of the smaller mills continue to take plate orders at 1.15c. The ruling prices for contracts are 1.20c. to 1.25c. for steel bars and plates for the first quarter and 1.25c. to 1.30c. for the second quarter. Structural material is quoted at 1.25c. for the first quarter and 1.30c. for the second quarter. The demand for iron bars has improved and local mills have more orders on their books than for some time. We quote iron bars at 1.20c., Cleveland. There is an inquiry out for 500 tons of structural material for the new plant of the Parish & Bingham Company, Cleveland, the erection of which was held up last year. The National Fireproofing Company has the contract for fireproofing the Notre Dame Academy, Cleveland, involving 400 tons of reinforcing bars. The demand for forging billets is somewhat more active. One local consumer has covered for its first quarter requirements at \$23.50, Pittsburgh, and another sale of 300 tons is reported for the same delivery at \$25. Sheets are in more active demand than for some time and many consumers want to make contracts. Few mills care to make contracts beyond the first quarter. Minimum quotations are 1.85c. for No. 28 black and 2.85c. for No. 28 galvanized. Some first quarter contracts are being placed at an advance of \$1 a ton above these prices and at 1.40c. for blue annealed. The demand for rivets has improved and consumers quite generally are placing contracts. We quote structural rivets at 1.55c. and boiler rivets at 1.60c. to 1.70c. for the first half. A good volume of business in wire contracts was placed before the advance in price of \$1 a ton made late last week. Warehouse prices are unchanged at 1.80c. for steel bars and 1.90c. for plates and structural material.

Old Material.—Sentiment is better, but demand continues dull. The market is slightly firmer but quotations on most grades are unchanged. Sellers are looking for some advance in prices and both the yard dealers and producers are asking higher prices than they have been getting recently. Consumers, however, are unwilling to pay any advance so that to a certain extent a deadlock prevails. There is a fair demand for wrought scrap and quotations on railroad wrought have been advanced \$1 a ton. While steel plants are willing to take on some scrap at prevailing market prices, most of the plants have enough material on hand to last them a month or more. We quote, f.o.b. Cleveland, as follows:

Per Gross Ton	
Old steel rails, rerolling.....	\$12.00 to \$12.50
Old iron rails	12.50 to 13.00
Steel car axles	16.50 to 17.00
Heavy melting steel	9.50 to 9.75
Old carwheels	11.50 to 12.00
Relaying rails, 50 lb. and over.....	23.00 to 25.00
Agricultural malleable	9.00 to 9.50
Railroad malleable	10.00 to 10.50
Light bundled sheet scrap	7.00 to 7.50
Bundled tin scrap	11.00 to 11.50

Per Net Ton	
Iron car axles	\$18.50 to \$19.00
Cast borings	5.50 to 5.75
Iron and steel turnings and drillings	4.50 to 4.75
Steel axle turnings	5.75 to 6.00
No. 1 busheling	7.75 to 8.00
No. 1 railroad wrought	10.50 to 11.00
No. 1 cast	10.50 to 11.00
Stove plate	8.00 to 8.50

A patent (1,082,161) has been granted to Prof. Albert Lang, of Karlsruhe, Germany, for a method of protecting iron and steel from rust and corrosion. The inventor produces first an artificial layer of iron oxide on the surface of the metal by treating it with an iron salt. An anilin dyeing agent is then applied, which combines chemically with this layer to form a permanent rust-proof color lake, stable to acids, alkalis, etc.

British Purchases of Sheet Bars

Germany and Belgium Sellers—Steel Corporation Advances Price—Scotch Iron Production

(By Cable)

LONDON, ENGLAND, January 14, 1914.

Markets are quiet and waiting developments, though a little more is doing in semi-finished material. Some big consumers have covered requirements in sheet bars for the first half, mainly from Germany and Belgium, round 80s. (\$19.46) f.o.b. Antwerp. The United States Steel Products Company has raised the price of sheet bars to 87s. 6d. (\$21.28) c.i.f. Liverpool.

Scotch pig-iron production for 1913 was 1,377,000 gross tons and the consumption, 1,039,000 tons. Stocks at the end of December amounted to 189,000 tons and 67 furnaces were blowing against 90 at the beginning of the year. Stocks of pig iron in Connal's stores are 134,015 gross tons, against 138,924 tons last week. We quote as follows:

Tin plates, coke 14 x 20, 112 sheets, 108 lb., f.o.b. Wales, 12s. 7½d. (\$3.07).

(The following prices are per ton of 2240 lb.):

Cleveland pig iron warrants (Tuesday), 50s. 5d. (\$12.26), against 50s. 1d. (\$12.18) one week ago.

No. 3 Cleveland pig iron, makers' price, f.o.b. Middlesbrough, 50s. 9d. (\$12.35), the price of two weeks' ago and a rise of 3d. over last week.

Hematite pig iron, f.o.b. Tees, 61s. 6d. (\$14.96).

Ferromanganese, £9 5s. (\$45.01).

Steel sheet bars (Welsh), delivered at works in Swansea Valley, £4 10s. (\$21.89).

Steel bars, export, f.o.b. Clyde, £6 (\$29.20).

Steel joists, 15-in., export, f.o.b. Hull or Grimsby, £5 7s. 6d. (\$26.15).

Steel ship plates, Scotch, delivered local yards, £6 17s. 6d. (\$33.46).

Steel black sheets, No. 28, export, f.o.b. Liverpool, £9 (\$43.80).

Steel rails, export, f.o.b. works port, £6 2s. 6d. (\$29.81).

(The following prices are per export ton of 1015 kilos, equivalent to 2237.669 lb.):

German sheet bars, f.o.b. Antwerp, 81s. (\$19.70), a decline of 1s. 6d. (or from \$20.07).

German 2-in. billets, f.o.b. Antwerp, 76s. (\$18.48), a decline of 40s. (or from \$19.46).

German basic steel bars, f.o.b. Antwerp, £4 11s. to £4 12s. (\$22.13 to \$22.37).

German joists, f.o.b. Antwerp, £5 2s. to £5 5s. (\$24.82 to \$25.55).

(By Mail)

Effect of Steel Corporation's Sales of Semi-Finished Steel to England

LONDON, January 3, 1914.

So far the new year has not brought anything of importance to the iron and steel trades of the United Kingdom, but there are strong hopes that the next few weeks will witness a complete change from the gloom prevalent during recent months. Yet the volume of business in sight is nothing to feel very enthusiastic about.

The cable will have brought you one really important piece of news, which is that the United States Steel Corporation has at last come out as a seller of semi-finished steel in the European markets. This course, if persisted in, is certain to involve a modification of the German position. The Germans have all along been bullishly disposed as regards prices, even when things looked their worst, but they never contemplated the opening of the books of the Americans to export orders in such material as sheet bars and billets. This week sales of both these descriptions of half finished steel have been made by the representatives of the United States Steel Corporation and probably further business is merely a matter of days. So far it has not been possible to sell to Wales, as the freights from your side are unfavorable, hence the business done has been for shipment to Liverpool. It is unfortunate that this competition should have developed just as there was a bare

chance of slightly better times. While the French works are generally regarded as being of only third-rate importance as sellers of semi-finished steel, it may be worth recording that one or two of them are now talking of taking really big lines, which seems to threaten an extension of their export programmes.

Roundabout Reduction in German Beams

Finished iron and steel are quiet and consumers are looking out for indications of the turn of events. The reduction in the prices of Continental joists has been made in the curiously cumbersome method so dear to the German mind. Instead of declaring a cut of 3s. a ton for England and of 6s. a ton for elsewhere, they apparently got their circumlocution office to put in a few extra shifts with the following result: Step No. 1. It was decided that the basis price, which was £5 11s. (\$27.01) f.o.b., should be reduced to £5 5s. (\$25.55). Step No. 2. It was decided that the rebate for the North of England, which stood at 6s. a ton, should be reduced to 3s. a ton. Step No. 3. It was decided that the rebate of 3s. a ton for the South of England should be canceled altogether. Step No. 4. It was decided that the rebates in force to other parts of the world should not be interfered with. As stated, the net result is that prices for England are down 3s. and those for everywhere else are cut 6s. a ton. People do not seem to be too optimistic as to this rearrangement of prices bringing in any substantial business.

Birmingham

BIRMINGHAM, ALA., January 12, 1914.

Pig Iron.—For early delivery, one large interest openly admits that it has been selling at \$10.75 for first quarter, while asking \$11 for the second quarter. At the same time this interest does not report customers falling over one another to get the iron. Another company, which has denied selling anything under \$11, reports booking 2000 tons in the past week on that basis. This concern has been offered business on the basis of \$10.75, but declined it and it is understood it went elsewhere. Several furnace interests are holding for \$11, with special analysis iron bringing more. Inquiries are good, but the general sales situation is very much what it was prior to the holidays. Brokers express themselves as less sanguine for the immediate future than they were in the first week of 1914. The iron makers declare there is little change. There has been no report of sales made to the leading pipe interest. The manufacture of charcoal iron has been reduced to the output of one stack, that of the Rock Run furnace. The Shelby Iron Company, the leading charcoal iron maker, has closed down and has accumulations on hand. However, this iron is still held at \$23.50 to \$24. We quote per gross ton f.o.b. cars Birmingham district furnaces (the first figures representing the low early delivery and the latter the low second quarter price) as follows:

No. 1 foundry and soft.....	\$11.25 to \$11.50
No. 2 foundry and soft.....	10.75 to 11.00
No. 3 foundry.....	10.25 to 10.75
No. 4 foundry.....	10.00 to 10.50
Gray forge.....	9.75 to 10.25
Basic.....	10.75 to 11.00
Charcoal.....	23.50 to 24.00

Cast-Iron Pipe.—There is a better tone in the pipe field. While there have been no large bookings there is a more active inquiry than in some time and the general expectation is for better business. Orders for several hundred tons of large pipe and fill-in orders amounting to a considerable in the aggregate have been received. The National Cast Iron Pipe Company's new plant has not yet announced the date when it will begin operations. We quote \$22 for 4-in. and \$20 per net ton for 6 in. and upward f.o.b. cars at pipe yards.

Coal and Coke.—There has been no improvement in the coal situation either as to demand or prices. Even shaded quotations have failed to elicit orders from domestic yards which have not disposed of stock on hand. The Tennessee Coal, Iron & Railroad Company has secured the contract for the 200,000 tons for the Nashville, Chattanooga & St. Louis Railroad for 1914.

Furnace coke can be purchased as low as \$2.50, while foundry coke is also not strong. We quote per net ton f.o.b. ovens as follows: Furnace coke, \$2.50 to \$2.75; foundry, \$3 to \$4.

Old Material.—Heavy machinery scrap is active, but other descriptions are reported as leaving yards spasmodically, with some deals on the bargain order. However, the general feeling among old material dealers is hopeful rather than otherwise. They continue to quote the following prices per gross ton, f.o.b. dealers' yards:

Old iron axles (small).....	\$15.00 to \$15.50
Old steel axles (light).....	15.00 to 15.50
Old iron rails.....	12.50 to 13.50
No. 1 railroad wrought.....	12.00 to 12.50
No. 2 railroad wrought.....	10.00 to 10.50
No. 1 country wrought.....	9.50 to 10.00
No. 2 machinery cast.....	10.50 to 11.00
No. 1 steel scrap.....	10.50 to 11.00
Tram carwheels.....	10.50 to 11.00
Standard carwheels.....	12.00 to 12.50
Light cast and stove plates.....	9.00 to 9.50

German Steel Firmer, Pig Weaker

BERLIN, January 1, 1914.

Trade has been more than usually quiet. During the holidays the companies have been making up their yearly inventories, and where work was not pressing the holidays were extended beyond their ordinary limits.

From the southwestern district it is reported that the whole market has become firmer, and that the various works are fully maintaining the higher prices for bars and iron plates recently adopted. For pig-iron, however, the price situation continues weak. Up to the end of last week the Syndicate had sold only 600,000 tons for 1914 delivery, or only about 20 per cent. of the aggregate allotments, not including the Luxemburg group. Foundries are holding back orders, or else buying only for immediate consumption; while others, favorably situated for water transportation, are buying English iron. The contracts for the latter have been much increased of late. At Berlin, Hamburg, and some other towns co-operative arrangements have been made for importing iron from England. The foundries assert their determination to keep up the fight till the Syndicate makes further price concessions and it is now stated that this action is to be taken, although it is not clear whether reductions are to be general or to apply to points where English iron is competing. The position of scrap continues to grow worse.

Some chartering for ore shipments was reported in the closing days of the year. First grade Santander ores cost 16.25 marks (\$3.86) and Rubio ores from Bilbao 17 marks (\$4.04) a ton, delivered at Ruhr ports. Nothing new has developed in manganese ores.

The Gutehoffnungs-Hütte will erect a new rod mill at Oberhausen. The Gelsenkirchen Company has just begun to roll Grey beams at its Adolf-Emil Hütte in Esch. The Deutsch-Luxemburg Company had hitherto been the sole owner of the German patents for the Grey process, manufacturing them at Differdingen in Luxemburg-Lorraine.

Expressions of opinion among iron men, printed in the daily press in the past few days, regarding prospects for 1914, show considerable variety of views. An important ironmaster, apparently the manager of the Steel Works Union, thinks that low-water mark in the present period of depression in the iron and steel market has been passed; but the view is general that everything will depend upon developments in the money market. Some manufacturers, assuming that money is going to be easy this year, adopt a rather cheerful tone in forecasting prospects.

Boston

BOSTON, MASS., January 13, 1914.

Old Material.—Dealers report some increase in inquiries, which in New England seems a hopeful symptom of trade conditions, after a period of weeks in which scrap has appeared to be almost a drug on the market. They also reflect in their statements of opinion regarding the future the generally increasing belief that the low level of business has been passed and that the trend is now upward. Prices have not changed, unless it be that sentimentally the inclination is toward higher figures. The advance will be quite gradual, according to the accepted theory. The quotations given below are based on prices offered by the large dealers to the producers and to the small dealers and collectors, per gross ton, carload lots, f.o.b. Boston and other New England points which take Boston rates from eastern Pennsylvania points. In comparison with Philadelphia prices the differential for freight of \$2.30 a ton is included. Mill prices are approximately 50c. a ton more than dealers' prices:

Heavy melting steel	\$7.75 to	\$8.00
Low phosphorus steel	13.75 to	14.75
Old steel axles	13.25 to	13.75
Old iron axles	21.25 to	21.75
Mixed shafting	12.25 to	12.50
No. 1 wrought and soft steel	9.00 to	9.25
Skeleton (bundled)	6.00 to	6.50
Wrought iron pipe	6.50 to	7.00
Cotton ties (bundled)	7.00 to	7.25
No. 2 light	3.75 to	4.25
Wrought turnings	4.50 to	5.00
Cast borings	4.50 to	5.00
Machinery, cast	11.25 to	11.50
Malleable	8.00 to	8.25
Stove plate	7.75 to	8.00
Grate bars	6.25 to	6.50
Cast-iron carwheels	11.00 to	11.25

St. Louis

ST. LOUIS, MO., January 12, 1914.

The buying movement has become more general, with the result that prices are being more firmly held, for the moment at least.

Pig Iron.—With a generally broader demand, individual sales were somewhat smaller on the average but with the demand from a diversity of industries. Included in the sales are five of 1000 tons each, all but one approximating No. 3 Southern; one of 1000 tons of No. 2 Southern; two of 400 tons of Southern; a half-dozen of 300 tons, Southern, and an equal number of 200-ton sales; 500 tons of No. 3 Southern; several of 300 and 200 tons of Northern, and one of 1300 tons of Northern. A sale of 200 tons of high silicon was also made. Altogether the sales of the week by all representatives will aggregate in excess of 15,000 tons. Prices were quite firm at \$11 for No. 2 Southern, Birmingham basis; \$13 for Ohio iron, Ironton basis, and \$14 for Chicago No. 2 X, deliveries generally for first half.

Coke.—A transaction under negotiation from the smelting interests involving about 15,000 tons of 48-hr. coke will, it is expected, be closed this week, as only a small difference separates the buyer and seller. By-product coke is quoted on a parity with Connellsville figures as given.

Finished Iron and Steel.—There was increased buying well diversified and coming in such manner as to lead the mill representatives to predict continued improvement in the buying. The Southwestern and other railroads are reported making tentative inquiry as to steel rails, but are mentioning no tonnages as yet. They are, however, taking fastenings freely and material for repair work. Beams, plates and bars, the latter both iron and steel, are steady here at \$1.20, Pittsburgh.

Old Material.—Consumers are feeling the market, though not making purchases except in small amounts, and dealers generally expect buying of considerable volume within the next thirty to sixty days. The sharpest demand is for foundry grades and steel. Relaying rails are also in sharp demand with no stocks on hand. Lists out included 1000 tons from the Missouri Pacific; 1000 tons from the Wabash; 1000 tons from the Mobile & Ohio; 700 tons from the Union Pacific; 300 tons from

the Vandalia, and 6000 tons from the Southern. Such as closed went at better prices than have been commanded in some time. We quote dealers' buying prices, f.o.b. St. Louis as follows:

Per Gross Ton	
Old iron rails	\$11.25 to \$11.50
Old steel rails, re-rolling	10.75 to 11.25
Old steel rails, less than 3 feet	9.50 to 10.00
Relaying rails, standard section, sub-j. c. to inspection	23.00 to 24.00
Old carwheels	11.00 to 11.50
No. 1 R. R. heavy melting steel scrap	10.00 to 10.50
Shoveling steel	8.25 to 8.75
Brags, switches and guards cut apart	9.50 to 10.00
Per Net Ton	
Iron angle bars	\$10.25 to \$10.50
Steel angle bars	8.00 to 8.50
Iron car axles	16.00 to 16.50
Steel car axles	11.50 to 12.00
Wrought arch bars and transoms	11.00 to 11.50
No. 1 railroad wrought	9.00 to 9.50
No. 2 railroad wrought	8.50 to 9.00
Railroad springs	8.50 to 9.00
Steel couplers and knuckles	8.50 to 9.00
Locomotive tires, 42 in. and over, smooth	9.50 to 10.00
No. 1 dealers' forge	7.50 to 8.00
Mixed borings	3.50 to 4.00
No. 1 bushing	7.50 to 8.00
No. 1 boilers, cut to sheets and rings	6.00 to 6.50
No. 1 cast scrap	8.50 to 9.00
Stove plate and light cast scrap	8.00 to 8.50
Railroad malleable	7.50 to 8.00
Agricultural malleable	7.00 to 7.50
Pipes and flues	6.00 to 6.50
Railroad sheet and tank scrap	5.50 to 6.00
Railroad grate bars	7.00 to 7.50
Machine shop turnings	4.00 to 4.50
Bundled sheet scrap	5.00 to 5.50

San Francisco

SAN FRANCISCO, CAL., January 6, 1914.

While merchants and manufacturers express considerable confidence as to the future, no actual increase can be reported in the volume of business. Distributive trade in the country has started out fairly well, but the local movement is still closely restricted, shops and foundries reporting their business exceptionally dull. While some large consumers are taking a little more interest, and there is a fair tonnage in sight in a few lines, no great or general improvement is expected for two or three months. Merchants believe at least that much time will be required to demonstrate the effects of the tariff change and other factors influencing this market, and expect, meanwhile, to proceed with caution. Crop prospects in this district are excellent.

Bars.—The immediate demand for soft steel bars is light, and either foreign or domestic material can readily be had from store at comparatively easy prices. Some of the largest shipments of foreign material are not due until near the end of February, but previous arrivals will probably be ample for all requirements. There is accordingly little tendency to contract for forward delivery, though the tonnage needed for the year by manufacturers is expected to exceed that of last year. Apparently the imported material has not yet seriously encroached on the field of reinforcing bars, the demand for which is of the same desultory nature as before, with no large individual orders in sight.

Structural Material.—San Francisco and Oakland made a slight gain in building values for December, but other Pacific coast cities fell behind the previous year, and the immediate demand for fabricated material is light. Fabricators say the number of important jobs figuring has seldom been so small, and some recent contracts have been taken at very low figures. The principal requirements of the Exposition and local municipal buildings have been covered, and while a few office buildings are being planned the bulk of the work in prospect is on apartments, etc., of little individual importance. The Los Angeles wharf job was awarded to the Llewellyn Iron Works. The San Francisco labor temple is being figured, and it is reported that financial arrangements have been made for a 14-story office-building on Montgomery street. Plans have been started for a \$100,000 addition to Lane Hospital. Preliminary plans are under way for a \$600,000 municipal auditorium at Portland, Ore. The Southern Pacific Railroad has started work on a large drawbridge over Islais Creek, this city.

Rails.—The United States Steel Products Company has taken the contract for rails and spikes for the municipal railroad. Aside from this a fair business has been done in scattered carloads, both in light and standard sections. Tentative inquiries of some importance have appeared for light rails, principally from mining interests of Nevada and Arizona. The outlook for logging railroads is rather disappointing, but preparations are under way for numerous interurban extensions.

Plates.—There is considerable figuring on tank and pipe construction and manufacturers are gradually getting into the market for their needs of the next few months. Distributive trade is extremely dull, and merchants are placing practically no business for shipment from the mills.

Sheets.—The current consuming demand is light, and the action of some manufacturers in covering future requirements has been followed by few merchants, the latter continuing to buy in single carloads for prompt shipment.

Standard Pipe.—A slight but perceptible improvement is noted in oil country goods, though line casing, as well as boiler tubes, is a little lower in price. There has been some solicitation for business in these lines by agents for foreign mills, but they have so far found little encouragement. Jobbers continue to keep their stocks down, and, as deliveries are unusually prompt, are buying only for the most urgent requirements.

Cast-Iron Pipe.—With a better market for municipal bond issues, the outlook is improving, though there is little in immediate prospect except the Portland inquiry for 5200 tons, bids to be taken January 21. The 1200-ton order for Portland was taken by the American Cast Iron Pipe Company, which also has contracts for 100 tons for Santa Barbara and 125 tons for Seattle, Wash.

Pig Iron.—Foundry business is as dull as ever, and with occasional foreign shipments coming in no appreciable reduction has been made in spot offerings. There is no demand worth mentioning and the local market is weak, with no quotable basis of values.

Coke.—Business is still of a small and scattering nature, the aggregate movement being comparatively light, as few consumers not already supplied care to buy beyond the very moderate requirements of the immediate future. Arrivals are not so heavy as a month ago, but importers and dealers are still heavily supplied. Prices for immediate delivery remain about as before, \$13 to \$14 per net ton, ex yard.

Old Material.—Business in all lines is coming out rather slowly, as the immediate needs of the larger consumers are fairly well covered and the general demand is light. New offerings, however, are not large, and dealers are holding out for about the former prices. The position of steel melting scrap is still unsettled, with buyers holding off. Cast-iron scrap is quoted at \$18 per net ton; wrought scrap, \$13 to \$15 per net ton, and rerolling rails at \$15 per net ton.

Gilhuly & Ambler, Atlas Building, 604 Mission street, San Francisco, dissolved partnership by mutual consent. The Youngstown Sheet & Tube Company and the Pittsburgh Valve & Fittings Company have decided to maintain joint offices for California in the Atlas Building, with J. H. Gilhuly in charge as sales manager. A. B. Ambler, with offices in the Sheldon Building, 461 Market street, San Francisco, will represent in California, Oregon and Washington the Bryden Horse Shoe Company, Riverside Boiler Works, Roberts Brass Mfg. Company, Niagara Screw Company, and the several other companies formerly cared for by Gilhuly & Ambler.

The Central Metal & Machine Works, Rock Island, Ill., announces that the copartnership under that name of William W. Turner, Peter A. Reimers and James W. Armstrong was dissolved December 24 by mutual consent. The business will henceforth be conducted by Peter A. Reimers and James W. Armstrong as a copartnership under the same name and style.

Buffalo

BUFFALO, N. Y., January 13, 1914.

Pig Iron.—Heavy buying of all grades of pig iron has been the feature in the past 10 days, brought out by low prices from the producers. Undoubtedly a record was created as regards tonnage placed so early in January, which is usually the quiet period of the year on account of inventory taking and slackened operations at plants. The aggregate business for the week was approximately the same as for the previous week, and the total for the past five weeks, during which an aggressive selling campaign has been carried on by the Buffalo blast furnace interests to prevent the necessity of blowing out of furnaces or piling iron, was over 100,000 tons of foundry grades and malleable, for first quarter and first half delivery. Only in exceptional instances have sales been made for delivery during the second quarter except at some advance upon prices for quick shipment and first quarter. The large business placed has caused a slowing down and an advance in price schedules by the leading makers to \$13 f.o.b. furnace for all grades except No. 4 iron, which is 25c. to 50c. per ton lower. Consumers who have not contracted or hold no options at the low scale have apparently lost their opportunity. We quote as follows for prompt and first quarter delivery f.o.b. furnace:

No. 1 foundry	\$13.25 to \$13.50
No. 2 X foundry	13.00 to 13.25
No. 2 plain	13.00
No. 3 foundry	12.75 to 13.00
Gray forge	12.50 to 12.75
Malleable	13.00 to 13.50
Basic	13.50 to 14.00
Charcoal	15.50 to 16.50
Charcoal, special grades and analysis.	17.00 to 19.50

Finished Iron and Steel.—The market has broadened considerably so that inquiry is now covering practically all lines. Buyers who have not been interested of late are now coming forward with inquiries and making efforts to supply their requirements. Offers for contracts for first half of the year are now being declined by most of the selling agents. Contracts covering first quarter only are offered and considerable business has been placed under contract in a quiet way at prices that show an advance over recent quotations. Actual orders booked show an increase over December. Prices on steel bars are firmly held at 1.20c. for prompt specification and new contracting for delivery extending through first quarter is being done at 1.25c. One producing interest under pressure is extending delivery through first half at this price, but only in limited quantities. Structural material is now held at 1.25c. for first quarter with plates not quite as strong, some business being reported at 1.20c. for early use. Wire products show increasing strength and following the lead of the largest producer some independents have withdrawn all outstanding quotations and the market is being firmly held at \$1.55 base for nails with considerable contracting for a 60-day period. Chain prices have been advanced \$2 per ton by a number of manufacturers, so that $\frac{3}{4}$ -in. proof coil is now held at 3c., other sizes in proportion. There have been a number of contracts closed for cold-rolled steel, delivery limited to first quarter only, and it is understood that the minimum price reached is 65 per cent. discount for carload lots—with some contracts closed at 64 per cent. Tin mill products also show increasing strength. In fabricated structural lines the market though quiet shows some improvement in tone with encouraging indications for the development of a good volume of business as winter draws to a close. H. S. Kerbaugh, Inc., 60 Church street, New York City, was low bidder for construction of the Erie Basin Terminal, Erie Barge Canal, at Buffalo, which will require a large tonnage of steel sheet piling and 600 tons of concrete reinforcing bars. H. S. Kerbaugh is president of the Empire Engineering Company, with offices in the Telephone Building, Buffalo. Erie Barge Canal Contract No. 110, requiring 500 tons of shapes, went to Chesley Earl & Heimbach, Inc., Buffalo, who are to sublet the steel and Erie Barge Canal Contract No. 116, requiring 400 tons of steel, was awarded to the Walsh Construction Company, Davenport, Ia. The steel for public

school No. 13, Buffalo, about 300 tons, went to the C. F. Ernst Son's Iron Works and the Lackawanna Bridge Company, this city, has 250 tons for a coal-handling outfit for export to Cuba. The Onondaga Structural Steel Company, Syracuse, has the steel for the dormitory for the New York State Custodial Asylum for Feeble Minded Children at Newark, N. Y. Plans are being completed for a grandstand for the Federal League Base Ball Club at Buffalo. Twelve out of fourteen open-hearth furnaces of Plant No. 1 of the Lackawanna Steel Company are now in operation and four more open-hearth furnaces are under construction.

Old Material.—The market now shows activity all along the line and prices have advanced on some commodities. Heavy melting steel is in good demand at 25c. per ton higher than a week ago. Turnings and borings also continue active with an advance of 25c. per ton in price. Sales are limited to small tonnages for the reason that dealers are confident that they will be able to secure higher prices within a short time. We quote as follows per gross ton f.o.b. Buffalo:

Heavy melting steel	\$10.00 to \$10.75
Bundled sheet scrap	6.25 to 6.75
No. 1 busheling scrap	8.75 to 9.25
No. 2 busheling scrap	6.00 to 6.50
Low phosphorus steel scrap	15.00 to 15.75
Iron rails	15.00 to 15.50
No. 1 railroad wrought	12.00 to 12.50
No. 1 railroad and machinery cast scrap	12.00 to 12.50
Steel axles	17.00 to 17.50
Iron axles	22.50 to 23.00
Carwheels	11.00 to 11.50
Railroad malleable	10.50 to 11.00
Locomotive grate bars	9.50 to 10.00
Wrought pipe	8.50 to 9.00
Machine shop turnings	5.25 to 5.75
Heavy steel axle turnings	8.25 to 9.00
Clean cast borings	5.75 to 6.25
Stove plate (net ton)	9.75 to 10.00
Bundled tin scrap	12.00

The Hurwitz Iron & Metal Company, Syracuse, N. Y., has been incorporated by L. L. M. and R. C. Hurwitz with a capital stock of \$50,000, to deal in old material, and will equip a yard.

New York

NEW YORK, January 14, 1914.

Pig Iron.—Not as much business has been closed in this territory in the past week as in the week preceding. Prices are no firmer in Eastern districts, though it is understood that one or two Buffalo sellers, having taken on heavy tonnages at \$12 and slightly higher for No. 2 X foundry iron, are now disposed to quote \$13. This would put them on a parity in New England with some eastern Pennsylvania furnaces. For example, \$13.55 at eastern Pennsylvania furnaces was quoted in New England on No. 2 X iron, the freight to the point of consumption being \$1.90, while from Buffalo it is \$2.45. Eastern Pennsylvania furnaces are not making correspondingly low prices to nearby districts, though \$13.75 to \$14 at furnaces has been the range with some sellers. Purchases of pipe iron include round lots for delivery at Eastern works, among these being a Delaware river plant of the largest maker. Southern pipe iron for Delaware River delivery is understood to have sold quite a little below \$14, which with \$4.20 freight would figure back to \$9.50 to \$9.75 Birmingham. In the general foundry trade inquiries for a total of 7000 to 8000 tons by four or five concerns are pending in this market, most of the foundries interested being located in New Jersey. The General Electric Company is understood to have bought about 6000 tons for delivery in first and second quarters, the business being distributed in several districts. We quote Northern iron for tidewater delivery as follows: No. 1 foundry, \$14.75 to \$15; No. 2 X, \$14.25 to \$14.75; No. 2 plain, \$14 to \$14.25. Southern iron is quoted at \$15 to \$15.25 for No. 1 and \$14.75 to \$15 for No. 2.

Finished Iron and Steel.—An increase in inquiries and an increase in orders over the betterment shown a week ago has cheered up sellers to such an extent

that they very generally are resisting any contracting or if contracts are urged are not as a rule extending them beyond the first quarter. Buyers, on the other hand, regard the present as merely a short term spurt and that demand will shortly recede along with prices. They point to recent large sales at figures below the present ruling market, such as 8000 tons of shapes and plates sold within 10 days or perhaps 2 weeks at 1.15c., Pittsburgh; 10,000 tons delivered into Pittsburgh by an outside steel mill at 1.15c. Pittsburgh; a moderate tonnage sold in the West at 1.12½c., and 1000 tons of plates sold in the East at what appears to be lower than 1.15c., Pittsburgh. On the other hand one steel company is consenting to close contracts for six months but places the contract price at 1.30c. and meets the present conditions by a temporary agreement to sell at 1.20c. The idea appears to be that the seller believes in an advancing market within the period covered and plans to be protected, though modifying the price to suit the market while it is below the contract price. Large new inquiries are still scarce but a number of projects have been closed, both for buildings and railroad cars. In fabricated material mention may be made of the following, totaling about 6000 tons: 570 tons for the Lenox Hill Realty Company, East Sixty-third street, to the Belmont Iron Works; 600 tons for small bridges and other work for the New York Central, 100 of which was taken by the American Bridge Company; 300 tons to Lewis F. Shoemaker & Co. for the Hershey Chocolate Works, Philadelphia; 800 tons to the Boston Bridge Works for the New Haven at Pawtucket, R. I.; 400 tons for the Lehigh Valley, of which about 250 is taken by the McClintic-Marshall Company and the remainder by the American Bridge Company; 750 tons for a bridge, Tenth street, Philadelphia, 450 tons for a hospital, 200 tons for the Boston & Albany, Springfield, Mass., and 350 tons for an addition to the Commonwealth cold storage building, South Boston, all taken by the McClintic-Marshall Company; 225 tons for the Southern Railway, Savannah, Ga., to the Phoenix Bridge Company; 360 tons for a mill building, Webster, Mass., to Jones & Laughlin Steel Company; 200 tons for a hospital at Middletown, N. Y., to John K. Cooke Sons, Athenia, N. J.; a race track grand stand, Havre de Grace, Md., to Pennsylvania Steel Company, and 200 tons for a hospital at Fairview, Pa., and 350 tons for a high school at Shamokin, Pa. Bids will be taken on the 4000 tons of steel piling for docks in New York on January 21; on 2000 tons for the court house at Albany, N. Y., on January 27, and 300 tons for the State School of Forestry, Syracuse, on January 29. In railroad cars, the Chesapeake & Ohio has increased its inquiry to 4000, having added 1000 gondolas. The Kanawha & Michigan has bought 1100 cars from the Ralston Car Company; the Santa Fé, 500 box and 300 automobile from the American Car & Foundry Company; the Buffalo Creek & Gauley, 200 hopper cars from the Pressed Steel Car Company; the Live Poultry Transportation Company, 200 cars from the Haskell & Barker Car Company; the New England Coal & Coke Company, 200 hopper cars from the Pressed Steel Car Company, and it is expected that the Delaware, Lackawanna & Western has at time of publication purchased 10 passenger cars from the Pullman Company. We quote mill shipments of steel bars at 1.20c., Pittsburgh, or 1.36c., New York; plates and plain structural material at 1.20c. to 1.25c., Pittsburgh, or 1.36c. to 1.41c., New York; iron bars, 1.25c. to 1.35c., New York. We quote iron and steel bars from store, 1.90c. to 1.95c., and shapes and plates 1.95c. to 2c.

Cast-Iron Pipe.—The New York Board of Water Supply, which has charge of the Catskill aqueduct, will open bids January 27 on the long-expected contract for 3800 tons of 36-in. flexible joint pipe for the extension of the mains to Staten Island. Manufacturers report a good volume of inquiry for spring delivery. The more active buying and the improvement in general prices have caused a slight stiffening in prices. Carload lots, however, are still quoted at \$22 to \$23 per net ton, tidewater, for 6 in.

Ferroalloys.—Sales of 80 per cent. ferromanganese are confined to small lots, mostly for early delivery.

While the general sentiment is better, there is no pronounced activity and the quotation is \$45, Baltimore. The market for ferrosilicon is quiet, with quotations standing at \$73 for carloads, \$72 for 100 tons and \$71 for 600 tons or over.

Old Material.—The situation has so far improved that consumers inquiring for old material are being quoted slightly higher prices than those at which they could have easily bought in December. More business is doing in various grades of rolling-mill stock and in cast scrap. But buyers and sellers are slightly apart in their views as to prices of steel scrap. Stove plate has been in especially better demand. Dealers' quotations are continued as follows, per gross ton, New York:

Old girder and T rails for melting	...	\$3.00 to \$8.50
Heavy melting steel scrap	.....	3.00 to 8.50
Relaying rails	.....	21.00 to 21.50
Rerolling rails	.....	10.00 to 10.50
Iron car axles	.....	18.50 to 19.50
Steel car axles	.....	12.50 to 13.00
No. 1 railroad wrought	.....	10.50 to 11.00
Wrought-iron track scrap	.....	9.00 to 9.50
No. 1 yard wrought, long	.....	8.50 to 9.00
No. 1 yard wrought, short	.....	7.75 to 8.25
Light iron	.....	3.00 to 3.50
Cast borings	.....	5.00 to 5.50
Wrought turnings	.....	5.00 to 5.25
Wrought pipe	.....	6.75 to 7.25
Carwheels	.....	11.00 to 11.50
No. 1 heavy cast, broken up	.....	10.50 to 11.00
Stove plate	.....	7.50 to 8.00
Locomotive grate bars	.....	6.50 to 7.00
Malleable cast	.....	7.00 to 7.50

Metal Market

NEW YORK, January 14, 1914.

The Week's Prices

Cents Per Pound for Early Delivery.

	Copper, New York		Tin,		Lead—		Spelter—	
	Lake	Electrolytic	New York	St. Louis	New York	St. Louis	New York	St. Louis
Jan. 8	15.00	14.50	36.35	4.15	4.05	5.30	5.15	
9	14.75	14.12 1/2	36.90	4.10	4.00	5.25	5.10	
10	14.50	14.12 1/2	...	4.10	3.97 1/2	5.25	5.10	
12	14.50	14.12 1/2	36.95	4.10	3.97 1/2	5.25	5.10	
13	14.50	14.00	36.80	4.10	3.97 1/2	5.25	5.10	
14	14.50	14.00	36.70	4.10	3.97 1/2	5.25	5.10	

Copper declined sharply following the producers' statement, but there is little or no business. Tin continues to fluctuate below 37c. Lead is lower and dull. Spelter is lower and quiet. Antimony is a trifle weaker and shares the dullness which pervades the entire market.

New York.

Copper.—There has been little or no business on domestic account. In Europe there have been sales of electrolytic on a basis equal to 14c., New York. The statement of the Copper Producers' Association was a great disappointment to the trade and since then prices have declined sharply. The nominal quotation of Lake to-day is 14.50c. The last figure at which sales were made was 15.12 1/2c. some time prior to the issuance of the statement. Electrolytic copper has actually been offered at 14c., at which quotation it stands to-day, and buyers are intimating that they expect to do better. London quotations to-day are £62 13s. 9d. for spot and £62 for futures. Exports this month total 14,175 tons.

Tin.—On Friday and Saturday about 250 tons was sold for future delivery, the business being mostly between dealers. On Monday there was fair inquiry from consumers, but they apparently changed their minds as to buying and consequently the market has been dull since the end of last week. Stocks are ample, but the bulk of the supply is held by a few hands and this accounts for an effort which was made in the week to hold up the spot price and get it up to the import cost or better. The effort failed for the reason that it did not have any demand from consumers to back it up. Tin is quoted to-day at 36.70c. The London quotations are £167 5s. for spot and £169 for futures. The arrivals this month total 1285 tons and there is afloat 1760 tons.

Lead.—The market has become dull again, despite a drop in price from 4.15c., New York, to 4.10c., New York, which was made effective January 9 by the American Smelting & Refining Company. The decline was a surprise to the trade as the belief was held generally that the New York price would go to 4.25c.

With the London quotation at £19 10s., as it is to-day, lead could be profitably exported if it declined but a few points in New York. The New York quotation is now 4.10c. and that in St. Louis 3.97 1/2c., though there are rumors of concessions in St. Louis.

Spelter.—The loss of a few points has brought spelter down to 5.25c. to 5.30c., New York, and 5.10c. to 5.15c., St. Louis. It is steady, but quiet.

Antimony.—This metal has softened slightly under the slow demand. Hallett's is quoted at 7c. to 7.12 1/2c., Cookson's at 7.37 1/2c. to 7.50c. and Chinese and Hungarian grades at 6c. to 6.50c.

Old Metals.—The market continues dull. Dealers' selling prices have been reduced and are now as follows:

	Cents per lb.
Copper, heavy and crucible	13.75 to 14.00
Copper, heavy and wire	13.25 to 13.50
Copper, light and bottoms	12.25 to 12.50
Brass, heavy	8.50 to 8.75
Brass, light	7.50 to 7.75
Heavy machine composition	11.75 to 12.00
Clean brass turnings	8.00 to 8.25
Composition turnings	10.75 to 11.50
Lead, heavy	3.90
Lead, tea	3.65
Zinc, scrap	4.10

Chicago.

JANUARY 12.—The unfavorable report issuing from the producers of copper injected no small degree of uncertainty into the market and this was reflected in a drop in the market quotations for the metal. Other metals, with the exception of lead, which also developed some weakness, remained unchanged at the close of the week. We quote as follows: Casting copper, 14.75c.; Lake copper, 15.25c., for prompt shipment; small lots, 1/4c. to 1/2c. higher; pig tin, carloads, 37.75c.; small lots, 39.75c.; lead, desilverized, 4.05c., and corrodng, 4.35c., for 50-ton lots; in carloads, 2 1/2c. per 100 lb. higher; spelter, 5.15c. to 5.20c.; Cookson's antimony, 9.50c.; other grades, 8c.; sheet zinc, \$7.50, f.o.b. La Salle or Peru, Ill., less 8 per cent. discount in carloads of 600-lb. casks. On old metals we quote buying prices for less than carload lots as follows: Copper wire, crucible shapes, 11.50c.; copper bottoms, 10.25c.; copper clips, 11c.; red brass, 10.75c.; yellow brass, 8c.; lead pipe, 3.50c.; zinc, 3.75c.; pewter, No. 1, 23c.; tin foil, 28c.; block tin pipe, 31c.

St. Louis.

JANUARY 12.—The metal market was better earlier in the week, but began to recede toward the end. The close to-day was 4c. to 4.02 1/2c. for lead and 5.10c. to 5.15c. for spelter. Tin was steady at 37.10c. to 37.35c.; Lake copper, nominal, at 15.35c.; electrolytic copper, 14.60c. to 14.85c.; Cookson's antimony, 7.80c. to 7.95c. In the Joplin ore market a weaker state was shown by zinc sulphides, which sold from \$39 to \$42 per ton for 60 per cent. The top settlement for the choicest was \$45. Calamine was slightly weaker at \$19 to \$22, with the top settlement at \$25 to \$26. Lead ore brought an increase of \$2 over the previous week, selling at \$50. Miscellaneous scrap metals are quoted as follows: Light brass, 4.50c.; heavy yellow brass, 7c.; heavy red brass and light copper, 8.50c.; heavy copper and copper wire, 9.50c.; zinc, 2.75c.; lead, 3c.; pewter, 22c.; tin foil, 27c.; tea lead, 2.75c.

A patent (1,080,224) has been granted to John W. Latcher, Edinburgh, N. Y., on an apparatus and process for refining steel. The inventor set out to produce blocks of steel which should be more solid and freer from segregation and impurities than ingot steel. The plan covered by the patent, which has not yet been employed commercially, is to pour steel from the ladle into counter-whirling ganister-lined pots, located on a large revolving table. The pots are to be kept hot by a gas blast projected downward upon the metal while it is whirling and gradually chilling. The hot blast is stopped after a brief time, but the pot continues in motion until the cast solidifies. While the steel is still at a high welding heat, the pot is emptied. Steel so whirled while chilling is claimed to be freed from impurities, such as slag, gases, etc., which are thrown to the surface and a steel obtained that is tougher and denser.

Iron and Industrial Stocks

NEW YORK, January 14, 1914.

Security values are slowly but steadily gaining in strength. The developments recently have generally been favorable. As much more interest in bonds is being shown by investors, prices of stocks are sympathetically affected. The range of prices on iron and industrial stocks from Wednesday of last week to Tuesday of this week was as follows:

Allis-Chalm., com.	9 - 9%	Ry Spring, com.	25 1/4 - 27%
Allis-Chalm., pref.	43 - 43 1/2	Ry Spring, pref.	95 - 96
Am. Can., com.	30 3/4 - 32 1/4	Republic, com.	20 - 22 1/4
Am. Can., pref.	90 3/4 - 92 3/4	Republic, pref.	81 - 83
Am. Car. & Fdy., com.	44 1/2 - 46 3/4	Rumely Co., com.	14 1/4 - 17 1/4
Am. Loco., com.	32 - 33 3/4	Rumely Co., pref.	26 1/2 - 41
Am. Loco., pref.	96 - 97 1/4	Sloss, com.	29 - 30
Am. Steel Fdries.	28 1/4 - 31 1/4	Sloss, pref.	90 - 90 1/4
Bald. Loco., com.	38 1/4 - 39	Pipe, com.	10 3/4 - 11 1/4
Bald. Loco., pref.	102 1/2 - 102 3/4	Pipe, pref.	40 - 41 3/4
Beth. Steel, com.	30 3/4 - 34	U. S. Steel, com.	58 1/4 - 60 3/4
Beth. Steel, pref.	68 - 71	U. S. Steel, pref.	107 - 108 1/4
Case (J. I.), pref.	93 3/4 - 95	Va. I. C. & Coke.	40 - 40 1/4
Colorado Fuel.	30 - 32 1/4	West'h'se Elec.	66 - 67 1/4
Deere & Co., pref.	94 - 95	Am. Ship, com.	30 - 32
General Electric.	140 1/4 - 141 1/4	Am. Ship, pref.	76 3/4 - 83
Gt. N. Ore Cert.	31 - 37 1/4	Chic. Pneu. Tool.	53 - 55
Int. Harv., com.	103 1/2 - 108 3/4	Cambria Steel.	47 3/4 - 48 3/4
Int. Harv., pref.	115 - 116	Lake Sup. Corp.	21 - 21 3/4
Int. Harv. Corp.	103 1/2 - 108 1/4	Pa. Steel, pref.	60 - 60 1/4
Int. Harv. Corp., pref.	116 - 116 1/4	Cruc. Steel, com.	14 1/4 - 15
Int. Pump, com.	6 1/4 - 6 1/2	Cruc. Steel, pref.	89 1/2 - 91 1/4
Int. Pump, pref.	19 1/4 - 20	Harb-Wk. Ref., com.	43 - 43 1/4
Nat. En. & St., com.	9 3/4 - 11 3/4	La Belle Iron, com.	40 3/4 - 41 3/4
Nat. En. & St., pref.	78 - 78 1/4	La Belle Iron, pref.	119 1/4 - 120 1/4
Pressed St'l, com.	27 - 31		

Dividends Declared

The Standard Underground Cable Company, regular quarterly, 3 per cent. and an extra dividend of 3 per cent., payable January 10.

The Chicago Steel Products Company has passed its dividend on the preferred stock. The company declared 6 per cent. in dividends during 1913, its first year in business.

The American Road Machinery Company, regular quarterly, 1 1/4 per cent. on the preferred stock, payable March 1.

The Harbison-Walker Refractories Company, regular quarterly, 1 1/2 per cent., on the preferred stock, payable January 20.

The United States Cast Iron Pipe & Foundry Company, regular quarterly, 1 per cent. on the preferred stock, payable January 15.

Gold Medals for Veteran Workmen

The Winchester Repeating Arms Company, New Haven, Conn., has presented to each of its 160 employees who have been with the concern continuously for 25 years or more a medal in appreciation of their long and loyal service. The medals are of 14-carat gold and are about the size of a half dollar. They are attached to a fob, the cross bars and swivels of which are also of gold. On the face is a relief portrait of the late Gov. O. F. Winchester and on the reverse is a suitable inscription, including the name of the recipient. One of these employees entered the company's factory in 1867 and four others in 1868.

Melting points of some metals which fuse at very high temperatures are published by G. K. Burgess and R. G. Waltenberg in the Journal of the Washington Academy of Science as follows: Titanium, 1795 deg. C.; vanadium, 1720 deg. C.; chromium, 1520 deg. C.; manganese, 1260 deg. C.; iron, 1530 deg. C.; cobalt, 1478 deg. C.; nickel, 1452 deg. C.

The Bureau of Standards, Washington, announces the preparation of a standard sample of sheet brass of the following approximate composition: Sn., 1 per cent.; Pb., 1 per cent.; Cu., 70.3 per cent.; Zn., 27 per cent.; Fe., 0.30 per cent.; Ni., 0.50 per cent. The fee, payable in advance, is \$3 per sample of about 150 grams.

Pushing the 1915 Census

WASHINGTON, D. C., January 9, 1914.—Director of the Census Harris will leave Washington in a few days to visit several leading cities, including Philadelphia, New York and Boston, for the purpose of conferring with committees representing the principal associations of manufacturers regarding the schedules to be employed in the census of manufactures for 1915. Among those with whom he will confer are the officials of the American Iron and Steel Institute and other representatives of iron and steel manufacturers. Arrangements have also been made to hold conferences with the Illinois Manufacturers' Association in Chicago and similar associations in cities throughout the Central West.

It is the purpose of the director to make the census of manufactures for 1915 unique in several important particulars. In the first place, the preliminary work, including the framing of the schedules upon which the inquiry will be based, is being undertaken a full year in advance of the date upon which the schedules will be placed in the hands of manufacturers for filling up, with a view to having every detail perfected well in advance and the representatives of all the leading industries thoroughly familiarized with the requirements of the work and ready to co-operate in expediting it. Second, the director intends to secure a much more complete consensus of opinion in the leading industries with regard to the scope of the inquiry and the details of the schedules than ever before. In preparing for the census of 1910 some effort was made in this direction but at too late a date to be effective, and, in addition, the attempt to reach representative trade organizations and individual manufacturers was far from comprehensive. In this case the director wishes to hear from every reputable manufacturer who has a criticism or suggestion to make, and the formulation of the schedules will be deferred until all the leading industries have been carefully canvassed. The third point in the director's programme is one that will be appreciated by everyone who is called upon at any time to deal with governmental statistical reports. On past occasions many of the most important bulletins in the census of manufactures have been so delayed in their publication that they were absolutely valueless to the industries affected except from a purely historical or academic standpoint. It is the present plan of the director to have his staff so organized and the work of his office so systematized that the assembling, digesting, and printing of the schedules will be expedited in an unprecedented manner, his aim being to publish and distribute the principal reports of the industrial census during the calendar year 1915, and he believes that with adequate co-operation on the part of manufacturers this can be done. If this project is carried through according to the director's plans, it will mark an epoch in the compilation and distribution of governmental statistics.

The new census of manufactures will cover the calendar year 1914, and with this fact in view, and keeping in mind the special efforts the director is now making to bring the matter to the attention of manufacturers, there would seem to be no reason why the final official blanks, which will be mailed promptly to all manufacturers on January 1, 1915, should not be filled up in a very short time and promptly returned to the Census Bureau. W. L. C.

The name of the Browning Engineering Company, Cleveland, Ohio, has been changed to the Browning Company.

THE STEEL CORPORATION SUIT

Southern Witnesses Testify That Competitive Prices Exist in Their Territory

The hearing in the suit for the dissolution of the United States Steel Corporation, which took a recess over the holidays in New York on December 19, was resumed Monday, January 5, in Atlanta, Ga., the first of five cities in the South and West where testimony in behalf of the corporation is to be taken. Examiner John A. Brown presided over the hearing, while special assistant to the attorney-general, Henry A. Colton, represented the Government and David A. Reed, Pittsburgh, appeared for the Steel Corporation. At the first day's session four witnesses were called by Mr. Reed, all of whom supported the contention of the defendant corporation that it does not maintain a monopoly so far as their experience had shown.

Clyde L. King, Atlanta Agricultural Works, the first witness, said various prices were quoted for bars and plates and that competition was keen between the sellers. He added that the Tennessee Coal, Iron & Railroad Company had shown big improvement, both in the quality of the goods sold and the promptness of deliveries, since it was bought by the corporation. J. C. Vance, dealer in horse shoes, structural shapes and steel bars, stated that he had driven the corporation out of Chattanooga in the sale of horse shoes, and that no monopoly exists in these products. George V. Denny, of Savannah, buyer of wire and pipe, gave similar testimony. G. C. Fulford, of Albany, said the corporation got very little business from him, because he could buy cheaper from the other companies.

On Tuesday, three witnesses were heard, Louis Gholstin and Isaac H. Haas, of Atlanta, and W. D. Krenson, of Savannah, all of whom expressed their belief that the Steel Corporation was not a monopoly in restraint of trade in view of the fact that there was competition, both as to price and quality in iron and steel products.

JAMES BOWRON GIVES HIS TESTIMONY

At Birmingham, Ala., January 9, the first witness called by the defense was James Bowron, president Gulf States Steel Company, formerly the Standard Steel Company. He gave a history of his connection with the iron and steel business from the time that he came to America from England. He stated that in 1882 he became treasurer of the Tennessee Coal, Iron & Railroad Company and later became general manager and the vice-president of the company. He left its service in 1901. He stated that while vice-president and treasurer of the company he had the active management.

Mr. Bowron told of why the Tennessee Company went into steel making. He said it was by suggestion of Milton H. Smith, of the Louisville & Nashville Railroad Company, who told President Baxter, of the Tennessee Company, that unless the Birmingham district took up the manufacture of steel it would go to the bad. The executive committee of the Tennessee Company was opposed to entering into the manufacture of steel, but Mr. Bowron urged his company to take steps to do so and after seven months' work raised \$110,000 to build the first steel mill at Ensley. The open-hearth furnaces and blooming mill were completed in 1899.

Mr. Bowron stated that he protested against payment of dividends by the Tennessee Company at different times and that he was compelled to bor-

row the money to pay dividends while this money was needed for improvements.

He said that he did not regard the purchase of the Tennessee Company by the United States Steel Corporation as monopolistic in its character, adding: "It was emphatically best for the community. For the first time the resources of this district have been placed where they could be developed on a broad scale." From his knowledge another steel company could be started in the district and acquire sufficient ore lands.

He described the property of the Gulf States Steel Company at Gadsden. He said the capacity of the steel plant per annum was 300,000 tons; rod mill, 120,000 tons; bar mill, 40,000 tons; wire nail plant, 50,000 tons; barbed wire plant, 25,000 tons; woven fence plant, 18,000 tons.

Mr. Bowron said his company competed with the American Steel & Wire Company and the Tennessee Company. He said that competition was keen and that he had never known of any combinations being attempted to control prices. He further said that the United States Steel Corporation did not resort to underhand methods and that its competition had always been fair, saying: "I regard its sales policy as eminently conservative. I regard it as a bulwark against chaos." He had known the Steel Corporation to refuse to follow up the market and advance its prices. He stated that the Tennessee Company had loaned his company assistance when an accident had occurred and added: "There have been other occasions when our company has been short of supplies that would have stopped our plants, and each time the Tennessee Company came to our rescue."

Mr. Bowron gave a number of interesting experiences of the Tennessee Company during his connection with it, showing the struggles of that company for capital and also indicating the unsatisfactory returns from its business at various times. Referring to sales of pig iron made for export in 1898, when the price realized was \$6.25 per ton at the furnace, he said that this simply resulted in the company getting back its money. He further testified that one-half of the blast furnaces in Alabama have been business failures in their efforts to produce and sell pig iron.

OTHER TESTIMONY GIVEN AT BIRMINGHAM

Mertland H. Hedges, president Casey-Hedges Company, Chattanooga, testified that he had been in the business of manufacturing boilers for 25 years, and that during this entire time competition had been keen for his orders for steel plates, sheets, rivets, etc. He said that he bought about 25 per cent. of his tonnage from the subsidiary companies of the United States Steel Corporation. He did not feel that he had been injured in any way by the acquisition of the Tennessee Company by the corporation.

Paschal G. Shook, Shook & Fletcher Company, iron broker, and formerly an official of the Tennessee Company, gave statistics of his purchases of billets, rails, etc., in 1911 and 1912, stating that about 25 per cent. had been purchased from the United States Steel Corporation, practically all of which was produced at the works of the Tennessee Company. He testified that he did not regard the purchase of the Tennessee Company by the Steel Corporation as monopolistic in its character, but that it had benefited all consumers of steel, the reason for this being the marked improvement in the plants of the Tennessee Company.

A. C. Converse, president Pierce-Evans Foundry Company, Chattanooga, gave testimony regarding

purchases made by his company. He said that competition is very keen, and that representatives of different iron manufacturing companies solicited his business. He stated that about 20 per cent. of the structural steel bought by his company was obtained from the United States Steel Corporation.

C. A. Hunt, president and general manager of the Memphis Steel Construction Company, Memphis, gave details of the business of his company, testifying that he purchased on a competitive basis and that prices varied. He stated that the Steel Corporation sold his company about 85 per cent. of the plates it used, but only a small percentage of the other products.

The Norton Sales Conference

The annual sales conference of the Norton Company and the Norton Grinding Company, Worcester, Mass., was held last week. The attendance was large and representative, not only of the selling department but of the various manufacturing ends of the business. The week was crowded with opportunities to get a more intimate knowledge of the several elements that enter into the abrasive wheel and grinding machine industry, and advantage was most enthusiastically taken by every one.

The conference opened Monday afternoon with an address of welcome by George I. Alden, and in the evening the research laboratories at Niagara Falls and Worcester carried through an illustrated outline of their work. Tuesday morning a general discussion was held, introduced by Hans Wickstrom and George C. Montague, of what wheels are most effective on different materials, such as soft steel, hardened steel, high-speed steel, cold-rolled stock, cast iron, brass, bronze, copper, etc., the difference of wheel requirement depending on type of machine. J. G. Spence made an address on efficient operation of cylindrical grinding machines. In the afternoon Messrs. Sandine, Thomson, Welker, Montague and White introduced a discussion on the question, Are we obtaining the maximum benefit from our wheel trial work? Are our trial reports of assistance and to what extent? R. P. Capron gave a résumé of trials.

In the joint session Wednesday Carl F. Dietz spoke on the Norton grinding wheel stands, floor and bench types, 1914 models, and Charles H. Norton on Norton surface grinding machines and other developments during 1913 by the Norton Grinding Company. In the afternoon W. F. Ford made an address on Alundum and Crystolon for polishing—W. F. polishing mixture; Herbert Duckworth on Crystolon in the granite industry; H. K. Dodge on abrasive grain in the glass industry; Albert Anderson on improvements and control in grain manufacture, and Harry Anderson on abrasives recently examined.

The programme for Thursday morning comprised papers by R. G. Williams on functions of the safety engineering department—protective devices as applied to grinding wheels; by Ross C. Purdy on glass wheel experimental work; by George S. Welker on use of grinding wheels in the glass industry, and by C. E. Gillett on the relation of wheel speed to production and power consumption. In the afternoon George N. Jeppson spoke on the shop; C. H. Norton had for his topic, Duplication in wheel manufacturing, wheels for different grinding operations, etc., and George Bouillon on automobile spring grinding in France.

The Friday morning joint session had for a feature a general discussion introduced by C. W. Jinnette, George W. Thomson, George C. Montague,

H. N. Harding and Oscar Knight, on functions of the complaint department. In the afternoon papers were read by Emil Johnson on stock supervision and requirements; by A. B. Fritts on advertising and publicity; by H. A. Stanton on credits and collections, and by B. F. Curtis on traffic service.

Annual Meeting of Efficiency Society

The Efficiency Society will hold its annual meeting in New York, January 26 and 27 at the Biltmore Hotel. Among the subjects to be discussed are the following:

An investigation of the methods of rating men, by Roger W. Babson, Babson's Statistical Organization, Boston, Mass., to be discussed also by Dr. Gustave Blumenthal, director of Vocational Guidance Bureau, Washington, D. C., by Melville W. Mix, president Dodge Mfg. Company, Mishawaka, Ind., and Dr. Katherine M. H. Blatchford.

Harry A. Hopf, department of issues, Germania Life Insurance Company, is to give demonstrations of his methods of standardizing office efficiency. H. Russell Brand is to describe his method for facilitating daily routine in connection with book-keeping. Willard C. Brinton, statistician, New York City, is to deliver an illustrated address on the graphic representation of statistics. Clinton D. Gilpin, West End, N. J., is to show charts of time and motion studies in the John Wanamaker department store in Philadelphia. E. R. Hudders, an accountant, is to describe a modification of the Dewey decimal system in keeping information files and is to offer suggestions for standardizing the terminology of business science.

W. M. Corse is to lead a discussion on "How to Introduce Scientific Management in a Foundry," and C. E. Knoeppel, New York, is scheduled to give practical suggestions on how to make motion studies. Dr. Melvil Dewey is to tell "How the Professional Man Can Keep His Own Systems," and W. M. Horner, Minneapolis, is to read a paper entitled "Rating Yourself."

A series of mental and manual efficiency contests have been arranged for the first National Efficiency Exposition and Conference, which will be held in the Grand Central Palace, New York, from April 4 to 11. The Efficiency Society will show efficiency, appliances, methods, and products in the industrial, mechanical, governmental, and household fields.

Cleveland Tool and Supply Company's Expansion

The Cleveland Tool & Supply Company, Cleveland, Ohio, has added a machinery department to its business, having taken over the lines of machine tools formerly handled in Cleveland by the Lake Erie Machinery & Supply Company. These include the tools made by the R. K. Le Blond Machine Tool Company, Ohio Machine Tool Company, Barnes Drill Company, Kern Machine Tool Company and Mueller Machine Tool Company. Several new lines have been added, including the sawing machines of the Espen Lucas Machine Tool Company and the boring machines of the Universal Boring Machine Company. The machinery department will be under the management of S. W. Sparks.

The Cleveland Tool & Supply Company was organized February 1, 1897, and started handling manufacturers' supplies in a small way, occupying one floor and a basement 28 x 40 ft. Its business has grown rapidly and it recently removed to a

four-story building on West Sixth street, where it occupies 62,000 sq. ft. of floor space, of which 75 x 100 ft. on the first floor will be used for the display of machinery. The company is the central distributor for the National Tube Company and is one of the largest distributors for the grinding machines and wheels of the Norton Company. In addition to various other supplies, it handles power transmission equipment. A formal machinery exhibit and opening will be arranged in February. Only new machinery will be handled. C. C. Coventry is president and treasurer; F. Conrad Wittich, vice-president; W. W. Kelly, secretary. Charles C. Wright is manager of the seamless steel tube department.

Connellsville Coke Shipments in 1913

The following statistical statement is taken from the Connellsville Courier, Connellsville, Pa.:

The Connellsville and Lower Connellsville coke regions shipped in the aggregate 20,097,901 net tons of coke during the year 1913, valued at \$59,288,808, the average price of all merchant coke being \$2.95 per ton.

While the year 1913 beats all records, it does not beat 1912 badly for quantity, but it shows cash returns nearly 55 per cent in excess. The trade of the past year would easily have distanced as well as broken all records had the business of the last quarter or even the final month kept up. It fell off half a million tons. The year went out under the depressing influences of a sweeping change in tariff policy to which the manufacturing interests of the nation have not yet adjusted their business.

The following tabulated statement gives a comprehensive view of the coke trade for the past 34 years, or during the whole period of its importance as an industry. It shows the aggregate number of ovens in commission at the close of each year, the annual output and the average price, as compiled from 1880 and published annually by the Courier:

Year	Total ovens	Tons shipped	Average price	Year	Total ovens	Tons shipped	Average price
1880	7,211	2,205,946	\$1.79	1897	18,628	6,915,052	\$1.65
1881	8,208	2,639,002	1.63	1898	18,643	8,460,112	1.55
1882	9,283	3,043,394	1.47	1899	19,689	10,129,764	2.00
1883	10,176	3,552,402	1.14	1900	20,954	10,166,234	2.70
1884	10,543	3,192,105	1.13	1901	21,575	12,609,949	1.95
1885	10,471	3,096,012	1.22	1902	26,329	14,138,740	2.37
1886	10,952	4,180,521	1.36	1903	28,092	13,345,230	3.00
1887	11,923	4,146,989	1.79	1904	29,119	12,427,463	1.75
1888	13,975	4,955,553	1.19	1905	30,842	17,896,526	2.26
1889	14,458	5,930,428	1.34	1906	34,059	19,999,326	2.75
1890	16,020	6,464,156	1.94	1907	35,697	19,029,058	2.90
1891	17,204	4,760,665	1.87	1908	37,842	10,700,022	1.80
1892	17,256	6,329,452	1.83	1909	39,158	17,785,832	2.00
1893	17,513	4,805,623	1.49	1910	39,137	18,689,722	2.10
1894	17,834	5,454,451	1.00	1911	38,904	16,334,174	1.72
1895	17,947	8,244,438	1.23	1912	38,884	20,000,873	1.92
1896	18,351	5,411,602	1.90	1913	39,067	20,097,901	2.95

The shipments were about 19,000 tons in excess of the estimated production. The figures for 1912 showed excess production of 32,000 tons, with additional stocks on yards. The strenuous efforts of the merchant operators to keep their yards clear and avoid stock coke will easily explain the slight excess shipments in 1913. It will also be borne in mind that the production figures are estimates, while the figures as to shipments are actual railroad weights. There is still some stock coke in the regions, especially at the plants of the furnace interests.

The Stora Kopparbergs Bergslag, one of the principal steel producers of Sweden, is making arrangements to increase its annual output of iron and steel from 100,000 to 300,000 tons. About 200,000 tons of this will be produced electrically.

Proposed Government Machine for Testing Large Size Girders

WASHINGTON, D. C., January 14, 1914.—The Director of the Bureau of Standards of the Department of Commerce has asked Congress to provide in the annual sundry civil appropriation bill an appropriation of \$100,000 to begin the construction of the largest transverse testing machine ever constructed in this or any other country. The total cost will approximate \$400,000 and it will be housed in a special building to be constructed at an additional cost of about \$250,000, of which Congress is now asked to provide \$75,000. This testing machine will weigh more than 200 tons and will be constructed to test to destruction plate and other girders up to 75 ft. in length and 12 ft. in depth, also full-sized brick and concrete arches and floor construction.

The transverse testing machine will be of massive construction and will be supported by four large screws, 16 in. in diameter, carrying a loading mechanism capable of loading the girders uniformly or at as many points as may be desired. The load will be applied by means of hydraulic cylinders, but the weighing device is of the lever type and is entirely distinct from the loading device. Tentative designs have been prepared for the machine but these will be modified and adapted in accordance with the expressed needs of engineers when the appropriation is secured. An important feature of the designing of this gigantic testing machine will be the consulting of engineering authorities throughout the country in order that the machine may be so built as to be available for all projects for which it is generally designed.

While the new machine will be the principal appliance to be housed in the special building, considerable other heavy testing equipment will be assembled under the same roof, as it is the intention of the director to bring appliances together to place the structural material work of the Bureau of Standards on a basis somewhat commensurate with the needs of the engineers of the country and superior to that of any foreign country.

The Bureau of Standards has recently put into operation its large tensile and compression machine of the Emery type, and is now engaged upon a series of tests of columns according to a programme arranged by the Column Committee of the American Society of Civil Engineers. In this connection several columns presented by the American Railway Engineering Association are being tested. A collateral investigation is now progressing at the Pittsburgh branch of the Bureau of Standards, where similar programmes are being carried out in connection with the 10,000,000-lb. compression machine there installed, including the testing of a series of built up brick piers in which the American Brick Manufacturers' Association is cooperating to ascertain the strength of brick column construction. These tests also include a series of concrete columns, with and without reinforcement, in which the American Concrete Institute is cooperating.

W. L. C.

The Chicago Foundrymen's Club, at its January meeting, held on the evening of January 10, listened to a very instructive description of the methods employed in manufacturing Carborundum abrasive wheels. The talk not only included the process details involved in the building up of the wheels but dwelt as well on the safety devices that have been perfected to prevent accidents in operation. An informal discussion on safety as associated with the use of abrasives followed.

Iron and Steel Electrical Engineers

The Pittsburgh section of the Association of Iron and Steel Electrical Engineers held its first meeting at the Seventh Avenue Hotel, Pittsburgh, on the evening of January 3. The meeting was presided over by President E. Friedlaender, Carnegie Steel Company, Braddock, Pa., and was preceded by a dinner and smoker.

B. G. Lamme and Charles Robbins, of the Westinghouse Electric & Mfg. Company, addressed the meeting. Mr. Lamme touched on the subject of frequency for steel mills and referred to the fact that 60 cycles was the standard efficiency for the central stations, while 25 cycles was largely standard for rolling-mill work. The possibility of complications where it is desired to substitute central station power for the isolated plant power was suggested. Some information was given in regard to the effect of heat and moisture on insulation of high voltage windings, and the speaker told of his experience with drying out electrical apparatus that had been submerged in water. It was pointed out that good results had been obtained by applying heat and vacuum to windings that had been wet when the application of heat alone would not accomplish the results. On the subject of cooling air for turbo-generators, it was mentioned that cooling the air through a fine water spray, thereby removing dirt and at the same time reducing the temperature, gave increased capacity. The smaller number of electrically-driven reversing mills in this country, particularly in the Pittsburgh district, as compared to the number in operation abroad, was commented on.

There were about 60 members and guests present, a larger attendance than was expected. The meetings are to be held the first Saturday of each month.

A Chicago section of the association is to have similar monthly meetings, under the guidance of R. Tschentscher, second vice-president of the association, and identified with the Illinois Steel Company, South Chicago.

Detroit Foundrymen's Association

At the regular meeting of the Detroit Foundrymen's Association, January 8, a paper written by J. W. Collins, Superintendent of the Aluminum Castings Company, was read, on "The Manufacture of Aluminum Crank Cases and Other Difficult Aluminum Castings." Mr. Collins discussed his subject under three headings—molding, coremaking and melting and pouring temperatures.

Resolutions were adopted reciting that the actions and methods of the Foundry & Machine Exhibition Company have become inimical to the life and purpose of the American Foundrymen's Association; that the attitude of the above company had caused the resignation of Dr. Richard Moldenke from the secretaryship of the American Foundrymen's Association, and that it was the sense of the Detroit Foundrymen's Association that all official connection between the American Foundrymen's Association and the Foundry & Machine Exhibition Company be severed. The resolutions expressed opposition to holding the 1914 meeting of the American Foundrymen's Association in Chicago, and directed that the president and secretary of the Detroit association send the resolutions through Joseph J. Wilson to the meeting of the executive board of the American Foundrymen's Association to be held in Chicago, January 17, 1914.

The meeting was largely attended. Dr. Burgess, of the Bureau of Standards, Washington, D. C., will address the meeting of February 12.

Eller Mfg. Company's New Plant

The Eller Mfg. Company, Canton, Ohio, has taken possession of its new plant for the manufacture of sheet metal specialties which has been in course of construction for over a year. The company makes the claim that this plant is the most complete and efficient in the sheet metal business up to the present time. The factory occupies one large building covering two acres. The greater part is one story, the only portion two stories high being that used for office purposes, comprising one corner of the structure, 56 ft. square, with its basement used for storage, the ground floor for offices and the second floor for a drafting room and a general meeting room. Numerous skylights afford an abundance of light for the interior of the factory. The window sashes are of metal and the company's Never Leak skylights and Konical ventilators are used, there being 146 skylights and 50 ventilators. The building is of brick and steel construction and completely fireproof.

All cars for loading run inside the factory where there is room for the loading of six cars at a time. The several departments are so located that the stock makes a full circuit during the process of manufacture, and when finished is located in a space set aside for manufactured products, convenient to loading platforms along the railroad track, and consequently avoiding any doubling back or rehandling.

The machinery used in this factory is practically all new, as little machinery was taken from the company's old factory where some of it had been in use for 30 years. All the machinery is driven by electric power. The company has seven acres of land in all, so that it has an abundance of room for expansion as the business may demand.

The business was started about 30 years ago by J. H. Eller and was long operated as J. H. Eller & Co. About eight years ago Mr. Eller sold out his interest and the new owners organized as the Eller Mfg. Company, of which the officers are as follows: J. F. O'Dea, president and treasurer; I. M. O'Dea, vice-president; H. V. Pay, secretary. The directors are G. W. Hilbish, Charles C. Bolus, I. M. O'Dea, H. V. Pay and J. F. O'Dea. These officers and directors are all actively connected with the business and give it their entire attention. The company carries at all times an exceedingly large stock, enabling it to ship all orders the same day they are received unless an order happens to be one for products which must be made up specially.

The factory is located directly on the Pennsylvania Railroad, but has switching connections with the Baltimore & Ohio and the Wheeling & Lake Erie. The products made are steel ceilings, cornice, skylights, metal roofing, eave trough, conductor pipe, ventilators and metal shingles. A New York office, with warehouse, is located at 134 Tenth avenue.

The production of pig iron in South Russia for the first six months of 1913 was 1,503,000 tons, as compared with 1,350,000 tons in the same period of 1912. The steel ingot output up to July 1, 1913, was 1,297,000 tons as against 1,192,000 tons for the first six months of 1912.

Large Copper Surplus for December

The report of the Copper Producers' Association for December shows the stock of copper on hand January 1, 1914, to be 91,438,867 lb., an increase of 43,509,438 lb. over that of the month previous, as against a gain in November of only 15,363,000 lb. This was a complete surprise to the trade, the expected increase having been estimated at not more than 15,000,000 lb. The December statement of the association compares as follows with that of November:

	December, pounds	November, pounds
Stock of marketable copper of all kinds on hand at all points in the United States at the first of the month	47,929,429	32,566,382
Production of marketable copper in the United States from all domestic and foreign sources in the month	138,990,421	134,087,708
Deliveries of marketable copper in the month:		
For domestic consumption	21,938,570	48,656,858
For export	73,542,413	70,067,803
Total	95,480,983	118,724,661
Stock of marketable copper of all kinds on hand at all points in the United States at the close of the month	91,438,867	47,929,429

The December increase is the largest total reported since last April, when it was 104,269,270 lb., and it is the greatest reported for any one month since the association began to issue reports five years ago. This was due principally to the large decrease in domestic consumption which amounted to only 21,938,570 lb. in December, a decline of 26,718,288 lb. from the sales in November, and more than 46,000,000 lb. from those in October. On the contrary the deliveries abroad in December were 73,542,413 lb., an increase over those in November of 3,474,610 lb. Production amounted to 4,902,713 lb. more than that of November. Total consumption was 23,243,678 lb. less than that of November and 40,816,180 lb. less than that of October.

The total output of refined copper in 1913 was 1,622,450,829 lb., as compared with 1,581,920,244 lb. in 1912. The total supply available during the year was 1,727,763,411 lb., as compared with 1,636,414,544 lb. in 1912. The total domestic consumption in 1913 was 767,351,760 lb., as against 819,665,948 lb. in 1912. The total deliveries were therefore about 100,000,000 lb. more than in 1912, due to the larger foreign shipments.

Pittsburgh and Valleys Business Notes

The Standard Engineering Company, Ellwood City, Pa., is building for the Detroit Seamless Steel Tube Company, Detroit, Mich., the new continuous seamless tube mill designed by R. C. Stiefel, Ellwood City, and referred to in *The Iron Age* of December 11, page 1361.

The Des Moines Bridge & Iron Company of Pittsburgh and Des Moines, Iowa, has opened a contracting office at 50 Church street, New York City, in charge of J. E. O'Leary, formerly one of its contracting engineers, to take care of trade in coast States north of Virginia and in eastern Canada. The company makes a specialty of designing and constructing hemispherical bottom steel tanks on steel towers for municipal, railroad and industrial purposes.

The plant of the Cyclops Foundry Company, Monongahela, Pa., was entirely destroyed by fire recently. The company operated a general gray iron foundry and was about to make some extensive additions to its works, much of the new equipment being on railroad sidings and ready to be installed. It has not yet decided whether it will rebuild.

The Apollo Steel Company, Apollo, Pa., maker of black and galvanized sheets, states that its plant is working full time, with enough specifications on hand

for black and galvanized sheets to run full for the next month. It has been very successful for a new concern.

The Columbia Steel & Shafting Company, Empire Building, Pittsburgh, maker of cold-rolled shafting, has opened an office in room 311 Weightman Building, Philadelphia, in charge of Joseph T. Somers, who has been representing the company in the Philadelphia district for three or four years.

At the bi-monthly examination of the sales sheets of the Republic Iron & Steel Company and the Western Bar Iron Association, held in Youngstown, January 10, it was found that the average selling price on shipments of common iron bars in November and December was not above 1.20c., and this rate entitles puddlers to \$5.85 per ton for January and February. It is said that the low prices ruling on bar iron in the Chicago district for some months are responsible for the low average price. The \$5.85 rate is a reduction of \$1.10 on the wage paid in July and August last year.

The Pittsburgh Steel Products Company, a subsidiary of the Pittsburgh Steel Company, operating blast furnaces, open-hearth steel plant, rod and wire mills at Monessen, Pa., and hoop and band mills at Glassport, Pa., has opened an office in room 1933 Railway Exchange Building, St. Louis, in charge of A. F. McCoole, manager of sales, and C. F. Palmer, supervisor.

The Superior Steel Company is installing in its works at Carnegie, Pa., a 42 x 50-in. Hamilton-Corliss engine, designed by the Hooven-Owens-Rentschler Company, Hamilton, Ohio, and which was purchased through its Pittsburgh office. The engine is designed to operate at 120 r.p.m. with 150 lb. working pressure and is to be direct connected to a 16-in. strip mill. The engine is equipped with the latest type gravity releasing valve gear and an improved flyball governor. The main journals have 28 x 46-in. bearings and the outer bearings are of the same dimensions. The total weight of the engine with flywheel is 500,000 lb. It will replace an old type Porter-Allen slide valve engine.

At the annual meeting of the structural section of the Engineers' Society of Western Pennsylvania, held in Pittsburgh last week, officers for 1914 were elected as follows: William E. Mott, professor of civil engineering, Carnegie Institute of Technology, chairman; George H. Danforth, assistant structural engineer, Jones & Laughlin Steel Company, vice-chairman; directors, F. R. Dravo, president Dravo Contracting Company; N. S. Sprague, superintendent bureau of construction, city department of public works; L. F. W. Hildner, chief engineer, Pittsburgh Bridge and Iron Company.

The regular monthly meeting of the Pittsburgh Foundrymen's Association was held in the Fort Pitt Hotel, Pittsburgh, on the evening of January 12. The meeting was addressed by W. B. Childers, formerly constructing engineer for the McClintic-Marshall Company, and who supervised the erection of the Gatun locks of the Panama Canal. He related some very interesting personal experiences. One point he brought out was that the Spanish negroes after two or three weeks' instruction made very efficient riveters, although as a whole the negro labor was very unsatisfactory. Mr. Childers is now connected with the Childers Construction Company, builder of highway bridges, with offices in room 338 Chamber of Commerce Building, Columbus, Ohio.

A meeting of stockholders of the Wheeling Mold & Foundry Company, Wheeling, W. Va., will be held the latter part of this month, at which the directors will recommend an increase in the capital stock from \$750,000 to \$1,000,000.

The Clinton Iron & Steel Company, operating Clinton blast furnace at Pittsburgh, has reduced 10c. per day the wages of employees receiving \$2.50 or more per day. Wages of ordinary day labor were not changed.

The Jackson Engineering Company, Pittsburgh, will install a system of Peerless third rail insulators for crane runways in one of the plants of the American Sheet & Tin Plate Company at New Castle, Pa.

Proposed Scrap-Iron Association

A meeting of dealers in iron and steel scrap doing business in Pittsburgh, Buffalo, Columbus, Cleveland, Indianapolis and other large Western cities, was held in the Fort Pitt Hotel, Pittsburgh, January 6. The object was to try to form an organization for the purpose of correcting some abuses, which, it is stated, have crept into the scrap trade. It is proposed to appoint inspectors to examine cars of scrap that are routed to the mills to find out whether the contents are up to the standards required by the contract. A committee of seven was appointed to take up the matters proposed at the meeting and make a report at another meeting to be called shortly. It is stated that three or four of the larger dealers in scrap in the Pittsburgh district do not feel that an association can be formed that will be of permanent benefit to the trade and that one leading scrap concern, with offices in three or four large Western cities, has absolutely refused to be identified with it.

Personal

J. B. Rider, general manager of the McKees Rocks and North Side plants of the Pressed Steel Car Company, Pittsburgh, has sailed for Europe, to be absent about two months.

J. I. Andrews, general manager of sales of the American Sheet & Tin Plate Company, Pittsburgh, is recuperating in Florida.

C. F. Blue, Jr., assistant general sales agent of the Crucible Steel Company of America, has resigned and is now connected with the Carbon Steel Company, with headquarters in Pittsburgh. He will be in charge of sales of special alloy steel products.

Col. H. P. Bope, vice-president and general manager of sales of the Carnegie Steel Company, Pittsburgh, addressed the Pittsburgh Publicity Association January 13, on the subject of "Salesmanship."

George Vernor Rogers, until several months ago secretary and factory manager of the Mitchell-Lewis Motor Company, Racine, Wis., has been elected general manager of the New York Tribune. He assumed his new duties January 1. He is a new man in the newspaper publishing field.

Fred E. Ayer, associate professor of the engineering department of the University of Cincinnati, Ohio, has accepted the deanship of the engineering college to be established in connection with the new Municipal University of Akron, Ohio.

W. H. Baltzell, chief draftsman at the Midland plant of the Pittsburgh Crucible Steel Company, has resigned.

C. E. Hanna, formerly with the Pittsburgh office of the Electric Controller & Mfg. Company, of Cleveland, Ohio, is now connected with the Pittsburgh office of Manning, Maxwell & Moore, and will handle the Shaw crane business in Pittsburgh territory.

Benjamin Nicoll, B. Nicoll & Co., New York, has resigned from the board of directors of the Vulcan Detinning Company.

A. A. Fowler, Rogers, Brown & Co., New York, sailed Wednesday on the Lusitania for England on a business trip. He will be absent six or seven weeks.

A. C. Cook, sales department Warner & Swasey Company, Cleveland, Ohio, who has been in Europe for nearly two years, will soon return to this country. He will be succeeded abroad by Charles J. Stilwell, who has been in charge of the New York office of the company. H. E. Witham, Cleveland, will have charge temporarily, at least, of the New York office. Mr. Stilwell will sail January 31 and Mr. Cook will return a few weeks later. F. A. Scott, secretary and treasurer of this company, will sail with Mr. Stilwell and will make a tour of the European offices.

Herbert W. Gwyn, for many years secretary of Richard Heckscher & Sons Company, Philadelphia, has fully recovered from the breakdown which forced him to retire from city life. He is now engaged in farming near Doylestown, Pa.

S. G. Weinberg, manager of the Henry R. Worthington Company at St. Petersburg, Russia, who is on a visit to this country, addressed the Export Club of Cincinnati, Ohio, at its regular monthly meeting held January 6.

W. F. Warden, president Burt Mfg. Company, Akron, Ohio, left last week for Florida, where he will spend three months.

Howard P. Eells, Cleveland, Ohio, president of the Bucyrus Company, sailed last week for a several weeks' trip to Egypt.

E. J. Lees, president Lees-Bradner Company, Cleveland, Ohio, sailed January 8 for France, where he will spend several weeks on business.

James Lippincott, vice-president and general manager of the West Leechburg Steel Company, Pittsburgh, with works at West Leechburg, Pa., has been made president, succeeding J. L. Kirkpatrick, who becomes vice-president. Frank H. Johnson, formerly assistant general manager, has been made general manager.

G. A. Wakefield, formerly with the Morgan Spring Company, Worcester, Mass., has accepted the position of general manager of spring sales with the Cleveland Wire Spring Company, Cleveland, Ohio.

W. J. McClain, formerly connected with the sales department at the general offices of the Republic Iron & Steel Company, Youngstown, Ohio, has been transferred to the Buffalo office of the same company, as assistant to M. E. Gregg, district sales manager, 901-903 White Building. Mr. McClain succeeds E. B. Mack, who has resigned to go into business on his own account.

Obituary

WILLIAM B. POLLOCK, a pioneer manufacturer of the Mahoning Valley, and for 60 years prominent in the business development of Youngstown, Ohio, died at his home in that city January 7, aged 81 years. He was born in Pittsburgh. The family soon after moved to Poland, Ohio. At the age of 20 Mr. Pollock went to Youngstown, where he was employed for some years by the Brier Hill Iron & Steel Company. Deciding to engage in business for himself, he started with a small boiler shop, which has since grown to the large establishment now operated by the William B. Pollock Company. Up to about two years ago he was president of the company and was then succeeded by his son, Porter Pollock. Mr. Pollock had the distinction of building the first of the Eliza blast furnaces at Pittsburgh for the Jones & Laughlin Steel Company.

WILLIAM C. DALZELL, South Egremont, Mass., died January 2, aged 68 years. He was president of the Dalzell Axle Company, treasurer of the Dalzell & Ives Iron Box Company, and director of the Mahalwe National Bank, Great Barrington, Mass. He leaves a widow, one son and two daughters.

Lower Sheet Mill Wages

The Alan Wood Iron & Steel Company, Philadelphia, has made a reduction of 10 per cent. in wages at its Conshohocken sheet mills, effective January 26. Its steel plant at Ivy Rock, Pa., is still idle, but the blooming mill will be put in operation at an early date, eight hours a day, to take care of current orders. This company has decided to blow out its blast furnace at Swedeland, Pa., on January 15. It has a considerable accumulation of pig iron as well as of steel ingots, and resumption dates for the steel mill and blast furnace are uncertain.

The J. Wood & Bros. Company, Conshohocken, Pa., operating sheet mills, has also announced a 10 per cent. wage reduction.

IRON AND STEEL INSTITUTE

Date of Spring Meeting Fixed—New Members Elected—To Have Associate Members

At a meeting of directors of the American Iron and Steel Institute in New York on Friday, January 9, a resolution was adopted fixing May 22 and 23 for the time of holding the spring meeting in New York City. The committee on programme is composed of James A. Farrell, chairman; E. A. S. Clarke, John A. Topping, Charles M. Schwab, John C. Maben and F. S. Witherbee. The maximum number of 1000 active members having been reached, it was increased to 1250, to take care of a waiting list of 100. New members were elected as follows:

Affleck, Benjamin, Universal Portland Cement Company, Chicago.
Baackes, Godfrey D., American Steel & Wire Company, Chicago.
Barrows, Oliver B., American Steel & Wire Company, St. Louis.
Belknap, Robert E., Pennsylvania Steel Company, Chicago.
Black, Edward G., Edgar Allen American Manganese Steel Company, Chicago.
Black, Herbert F., Cambria Steel Company, Pittsburgh, Pa.
Boynton, Donald S., Pickands, Brown & Co., Chicago.
Braine, D. L., Composite Tin Plate Company, 185 Madison Avenue, New York.
Bramard, James W., Carnegie Steel Company, Pittsburgh, Pa.
Burry, James, M. D., chief surgeon, Illinois Steel Company, Chicago.
Campbell, Thomas W., roll designer, Inland Steel Company, Indiana Harbor, Ind.
Charles, George H., American Rolling Mill Company, Middletown, Ohio.
Clark, John B., American Steel & Wire Company, Donora, Pa.
Clopper, Herbert G., New Jersey Zinc Company, 55 Wall Street, New York.
Conkling, Cloud C., Lackawanna Steel Company, Lackawanna, N. Y.
Cotton, Donald E., Illinois Steel Company, St. Paul, Minn.
Crane, L. W., Republic Iron & Steel Company, Chicago.
Cushman, Harry DePuy, American Rolling Mill Company, Cleveland, Ohio.
Deming, Fred C., Carnegie Steel Company, Buffalo, N. Y.
Dillon, A. H., Youngstown Sheet & Tube Company, Youngstown, Ohio.
Dillon, Paul W., Northwestern Barb Wire Company, Sterling, Ill.
Doyle, Harry S., American Steel & Wire Company, Chicago.
Ely, Walter C., Highland Iron & Steel Company, Terre Haute, Ind.
Gleason, William P., Indiana Steel Company, Gary, Ind.
Gregg, Robert, Atlanta Steel Company, Atlanta, Ga.
Hamilton, George W., Illinois Steel Company, Milwaukee, Wis.
Holmboe, L. C. B., Illinois Steel Company, South Chicago, Ill.
Holmes, George C., Lackawanna Steel Company, St. Louis.
Howard, Clarence H., Commonwealth Steel Company, St. Louis.
Howe, Frank P., manufacturer of pig iron, Philadelphia, Pa.
Hughes, William H., Hughes & Patterson, Philadelphia, Pa.
Hull, Elton B., Toledo Furnace Company, Toledo, Ohio.
Ives, Edward L., Iroquois Iron Company, Chicago.
Jackson, Percy R., Otis Steel Company, Cleveland, Ohio.
Jones, Harold C., Inland Steel Company, Chicago Heights, Ill.
Kagarise, John W., Carnegie Steel Company, Braddock, Pa.
Leahy, Frank E., National Tube Company, McKeesport, Pa.
Lee, Leif, Youngstown Sheet & Tube Company, Youngstown, Ohio.
Leonard, S. L., American Car & Foundry Company, Detroit, Mich.
Lovejoy, Frederick, West Pennsylvania Steel Company, 23 Cliff street, New York.
Lowell, George C., Indiana Steel Company, Gary, Ind.
Lozier, Charles E., vice-president Columbia Steel Company, Elyria, Ohio.
Lustenberger, L. C., Carnegie Steel Company, Pittsburgh, Pa.
McDonnell, Harry E., Illinois Steel Company, Milwaukee, Wis.
Mathias, David S., Illinois Steel Company, South Chicago, Ill.
Merriam, W. H., Oliver Iron Mining Company, Duluth, Minn.
Metcalf, Morris, Universal Portland Cement Company, Chicago.
Miller, C. D. S., president American Tube & Stamping Company, Bridgeport, Conn.

Mohr, Benjamin F., Illinois Steel Company, Chicago.
Morrison, H., Illinois Steel Company, Chicago.
Myers, William M., Highland Iron & Steel Company, Terre Haute, Ind.
Orr, Chester A., American Steel & Wire Company, Cleveland, Ohio.
Pinkham, Frank L., National Tube Company, Pittsburgh, Pa.
Porch, James W., Lukens Iron & Steel Company, New Orleans, La.
Raymond, Henry S., manager sales, National Tube Company, Chicago.
Rees, Joseph A., vice-president Empire Iron & Steel Company, Chicago.
Reeves, Samuel J., Phoenix Iron Company, Philadelphia, Pa.
Roe, James P., Glasgow Iron Company, Pottstown, Pa.
Rose, George E., Wisconsin Steel Company, Chicago.
Schonthal, Dez C., West Virginia Rail Company, Huntington, W. Va.
Sheldon, Harry E., Allegheny Steel Company, Pittsburgh, Pa.
Slagel, Franklin E., Lackawanna Steel Company, Buffalo, N. Y.
Slick, Frank F., Carnegie Steel Company, Braddock, Pa.
Sparhawk, Edw. M., Carnegie Steel Company, Denver, Colo.
Sprague, Arthur W., American Steel & Wire Company, Chicago.
Stillman, Charles A., Iroquois Iron Company, Chicago.
Sweetser, Ralph H., president Thomas Iron Company, Easton, Pa.
Sykes, Frederick W., American Steel & Wire Company, Chicago.
Thomas, Elmer W., Illinois Steel Company, Joliet, Ill.
Townsend, J. Fred, National Tube Company, Pittsburgh, Pa.
Tripp, Chester D., Rogers-Brown Ore Company, Chicago.
Vallat, B. W., Newport Mining Company, Ironwood, Mich.
Wesson, Leonard, Universal Portland Cement Company, Chicago.
West, James G., Jr., Illinois Steel Company, South Chicago, Ill.
Whaling, Montgomery, American Steel & Wire Company, Detroit, Mich.
Woods, John E., Carnegie Steel Company, Cincinnati, Ohio.

A meeting of the members is to be called at an early date for the purpose of amending the constitution of the Institute with the view of establishing a new classification of associate members, limited to 250.

Philadelphia Foundrymen's Association

At the January meeting of the Philadelphia Foundrymen's Association, held at the Hotel Walton on the evening of January 7, the most important business was the election of officers. The following were unanimously chosen: President, Thomas Devlin, Thomas Devlin Mfg. Company; vice-president, A. A. Miller, *The Iron Age*; secretary, Howard Evans, J. W. Paxson Company; treasurer, Josiah Thompson, J. Thompson & Co.; executive committee, Walter Wood, R. D. Wood & Co.; Thomas M. Eynon, Eynon-Evans Mfg. Company; Horace L. Haldeman, Pulaski Iron Company; W. T. MacDonald, Schaum & Uhlinger; Walter S. Bickley, Penn Steel Casting & Machine Company. Trustees, Thomas Devlin, Josiah Thompson and Howard Evans. Official chemist, George C. Davis.

A lantern-slide talk on Yale & Towne hoists and different types of hoisting and conveying units for the foundry was made by W. A. Hall, Yale & Towne Mfg. Company, Stamford, Conn. He showed and described the construction of the different types of these hoists. Following the meeting luncheon was served, and brief addresses were made by the officers elect and others.

Under the auspices of the Canadian Department of Mines, Dr. H. T. Kalmus, Boston, is conducting investigations for the discovery of a process for the reduction of cobalt from the silver-bearing ores of northern Ontario with which to form alloys for a light, strong material for automobile manufacture.

The output of by-product coke in 1913 at the Farrell works of the Carnegie Steel Company was 445,594 net tons, an increase of 24,932 tons over 1912.

The Machinery Markets

The machinery trade has little concrete evidence of better times, but the general feeling of confidence heretofore noted is unimpaired. In some sections there has been an increase in the number of small orders and more of these are pending. New York shares the general better sentiment, though trade is quiet. In New England a few substantial machine tool orders have been booked and on the whole there is a slight betterment, although buying is not general. In Philadelphia, where there is a much better outlook for power equipment, new business is moving slowly. Some single tool inquiries are coming out in Cleveland and the improved sentiment continues. Cincinnati is encouraged by reports of prospective railroad buying, although the export trade is dull and second-hand machinery in somewhat better demand. In Detroit there has been no material change, but the worst of the dull period is believed to be past. Confidence is stronger in Milwaukee and to some extent is based on sound and actual improvement. In the Central South the boiler makers are receiving a greater volume of inquiry and the general outlook is better. Inquiries have increased in St. Louis also and new enterprises are under more active consideration. Conditions are quiet in Texas, but no depression exists. In the Pacific Northwest, the demand for single tools has been showing up fairly well, but there is not much of present importance in metal working lines. The spring and summer is expected to bring exceptional activity in many industries on the coast which will create a corresponding demand for machinery.

New York

NEW YORK, January 14, 1914.

The better feeling of the last two weeks still pervades the trade and confidence in the future is more firmly intrenched in the minds of machine tool sellers, despite the fact that betterment has not yet taken any very tangible form. Three or four large turret lathes were purchased in the closing days of 1913 by the Bethlehem Steel Company and in the past few days there has been some closing of long deferred business, most of which involved small orders. In the cases of some inquiries before the trade there is evidence of excessively close buying. One such instance is known where the prospective purchaser advertised far and wide for bids on a few thousand dollars worth of machinery and received many estimates, calls from salesmen, etc., and then announced that it would look into second-hand machinery before placing any orders. The numerous expenses incidental to the effort to get at least a part of the business will in the aggregate exceed the total profits to be made. The case in question is an extreme one, but the trade is emphatic in condemning such methods, whether or not the intending purchaser is within his rights.

The American Krupp System-Diesel Engine Company, 165 Broadway, New York, has acquired the plant of the New York Engine Company, Watertown, N. Y., where it intends to manufacture stationary engines of the Diesel type. As was stated in *The Iron Age* a week ago, the plans of the company call for the establishment of a marine engine plant on the Atlantic seaboard, between Norfolk and New York. Charles A. Starbuck, of the company, states that the Watertown plant is well equipped to proceed at once with the manufacture of Diesel engines and little additional equipment will be needed at this time. Mr. Starbuck and others associated with him are also interested in the New York Engine Company and the New York Air Brake Company.

The Production Engineering Company, 1716 Spring Garden street, Philadelphia, Pa., has received an order for a foundry building 90 x 126 ft. to be erected for the De La Vergne Machine Company at 138th street and Locust avenue, New York City. Plans and specifications may be obtained from the Production Engineering Company, consulting engineer.

Waterbury & Sons, Oriskany, N. Y., have plans in preparation for an addition to be made to their felt mill to be erected next spring.

A. M. and W. H. Olmstead and M. Wetherill, Syracuse, N. Y., have filed articles of incorporation for the Olmstead Company with \$150,000 capital stock to manufacture saddlery, hardware, etc.

The AnSCO Company, Binghamton, N. Y., has let the contract for an addition to its factory.

The Maplewood Chemical Company, Binghamton, N. Y., has been incorporated by M. J. and M. Corbett, Corbettville, N. Y., and R. W. Wright, Binghamton, and will establish a plant for the manufacture of chemicals.

Lyons, N. Y., has voted in favor of municipal waterworks. The new plant will cost about \$142,000.

The Champlain Green Granite Company, Ausable Forks, N. Y., has been incorporated with a capital stock of \$30,000 and will install machinery for quarrying granite. J. H. Moore, Au Sable Forks, and A. B. and A. D. George, Dixon, Ill., are the incorporators.

The Stoetzel Blower Company, Wellsville, N. Y., has been incorporated with a capital stock of \$250,000 by E. G. Rathbone, Sr., Wellsville; J. J. Stoetzel and W. H. Dinspel, New York City, and will equip a plant for the manufacture of blowers, pumps, etc.

The National Textile Company, Cohoes, N. Y., is completing plans for the rebuilding of its mill recently damaged by fire. J. L. Murphy is manager.

Bids will be received until January 29 by the committee on public buildings of the board of supervisors, Albany, for heating, ventilating and vacuum cleaning systems for the new Albany County Court House.

The Wayland-Stauben Power Company, Wayland, N. Y., has been incorporated with a capital stock of \$50,000 for the equipment and operation of a power plant. V. M. and J. Kimmel and A. F. Kiefer are the directors.

Plans are being prepared for the rebuilding of the factory of Tim & Co., Cohoes, N. Y., recently damaged by fire. Burton S. Ellis is the manager, Troy, N. Y.

The Wanakena Heating Company, Wanakena, N. Y., has been incorporated with a capital stock of \$30,000 by L. G. Willson, Wanakena; W. R. Ventres, Port Allegany, Pa., and W. T. Bray, New York City, and will establish a woodworking plant at Wanakena.

The Curtis Machine Corporation, Jamestown, N. Y., is in the market for an automatic hot water pumping heating system to be installed in its enlarged plant.

The Batavia Canning Company, Batavia, N. Y., recently incorporated with a capital stock of \$55,000, is having plans completed for a factory for the manufacture of canned goods and food products. R. M. Decker, K. B. Mathes and B. H. Wood are the directors.

The J. B. Lyon Printing Company, Albany, N. Y., has let the contract for the erection of a printing plant building 108 x 120 x 88 ft., five stories and basement, which it will erect on Beaver street, to cost \$50,000. C. M. Winchester is vice-president and general manager.

The Meurer Steel Barrel Company, Port Jefferson, N. Y., has been incorporated with a capital stock of \$350,000 to manufacture steel containers. Andrew and Jacob Meurer and William W. Share, Brooklyn, are the directors.

Articles of incorporation have been filed by the

Boltless Arch-Bar Truck Company, Buffalo, with a capital stock of \$50,000. The new company will manufacture car trucks, railway equipment and supplies, frogs and switches and signaling and switching devices. Plans for a manufacturing plant have not yet been perfected, but will be a little later. Ralph S. Kent, Chamber of Commerce Building; Frederick C. Slee and Philip Catalano are the directors.

Articles of incorporation have been filed by the Batavia Preserving Company, Batavia, N. Y., which will take over and continue the operation of the preserving plant in Mill street, formerly operated by the Sprague Warner Co., of Chicago. Plans are being prepared by the new company for the erection of a new concrete building. The directors of the new company are Raymond M. Decker, Benj. R. Wood, Walter L. Bonney, Wm. H. Young and Kirke B. Mathes, Batavia.

The Lockport Shale Brick Company, Lockport, N. Y., manufacturer of red shale blocks for building construction, will erect and equip a new plant on Olcott road.

The Olympian Knitting Company, New York Mills, N. Y., is building a four-story addition to its factory, 50 x 154 ft., and an engine house, 35 x 47 ft.

Bids will be called for in January or February for a factory power house and dry kiln buildings, 42 x 256 ft., three stories of concrete brick and steel, to be erected by the Quaint Art Furniture Company on West Manlius street, East Syracuse. Charles L. Litchison, 1809 Park street, Syracuse, is president.

New England

BOSTON, MASS., January 13, 1914.

The market has changed to a slight degree for the better. A few of the machine tool builders have booked substantial orders, and inquiry indicates that other users will come into the market before long. Buying is by no means general however. The few large orders are not yet supplemented by the proper quota of small lots. New England itself is not a good customer, and local dealers have not yet experienced an encouraging revival of interest on the part of those who make up their clientele. The fact, several times stated, that few if any cancellations of orders for machinery or other equipment—in fact of any metal products—have been recorded, has been accentuated with the passage of time. Inquiry in the machine tool industry fails to find instances of what is the scourge of a depression which extends beyond the "holding up" degree of seriousness. It may also be stated with emphasis that not a few users of machinery state privately that they are ready to carry forward plans for increasing capacity as soon as the market shall have reached a point upward that will assure a permanency of a new condition. Some of these people will place orders in the near future and are already making inquiries.

The New England newspapers have been far from encouraging in their special reports from the steel and iron centers, in the last two months. It may be an auspicious sign that this week their correspondents express very hopeful views, which should have an influence upon those who trust to such vehicles of information.

Connecticut industrial stocks are active, at good prices, local investors showing a strong inclination to place their January income in these securities. The recent issue of \$500,000 common stock of the New Departure Mfg. Company, Bristol, Conn., offered to stockholders at par, was a decided success, all being taken by the stockholders. The common stock is quoted at 120 bid, 125 asked, and the preferred at 100 bid, 102 asked. Other manufacturing corporations are equally prosperous, according to the quotations of their stocks on the Hartford exchange. For example, American Hardware Corporation remains unchanged at 116½ bid; Colt's Patent Fire Arms Mfg. Company at 160 bid, 165 asked; Bristol Brass Company at 38 bid, 40 asked; Eagle Lock Company, Terryville, at 48½ bid, 50 asked. Recent sales of American Brass Company were at \$133 and \$134 a share.

The New England Iron Works Company is erecting a boiler shop at South Boston, Mass., to cost \$30,000.

George B. Clark and Ernest L. Nettleton, Milford, Conn., have purchased a property at Oakville, a suburb of Waterbury, Conn., and will establish a factory for the manufacturing of automobiles and other vehicles.

The H. B. Smith Company, Westfield, Mass., manufacturer of boilers and other heating appliances, has acquired 10 acres of land on North Elm street, which will be used for future extensions of the plant.

The Hartford Rubber Works Company, Hartford, Conn., has increased its capital stock from \$1,000,000 to \$2,000,000. It is reported that the company proposes to make large additions to its works.

The Millbury Steel Foundry Company, Millbury, Mass., is projecting an addition to its plant. W. W. Brierly has been made general manager of the business as a promotion from superintendent.

The Connecticut Electrical Mfg. Company, Bridgeport, Conn., has increased its capital stock from \$25,000 to \$200,000.

The Union Hardware Company, Torrington, Conn., has purchased a tract of land upon which it proposes to erect an additional factory building.

The Union Twist Drill Company, Athol, Mass., is preparing plans for a factory of substantial size to be erected on the Canadian side of Derby Line, Vt.

The Grace Machine Company, Burlington, Vt., has organized to establish a general machine and repair business. The incorporators are John W. Grace, Bernard B. Whalen and Cornelius A. Whalen.

The new plant of the South Norwalk Engineering Company to be erected at Stratford, in the suburbs of Bridgeport, Conn., will be 60 x 150 ft., three stories.

The Ansonia Brass & Copper Company, Ansonia, Conn., has begun the construction of an additional factory building 60 x 440 ft., of steel and brick.

The wood turning factory of Williams & Marvin, Deep River, Conn., was burned, January 3, with a loss of \$18,000.

The Index Visible Company, New Haven, Conn., has begun the erection of a factory 35 x 90 ft., two stories, of mill construction.

The Mysto Mfg. Company, New Haven, Conn., has awarded the contract for a factory building on Foote street, 45 x 80 ft., two stories, mill construction.

Morris & Co., Bridgeport, Conn., has begun the construction of a factory 32 x 200 ft., two stories.

Philadelphia

PHILADELPHIA, PA., January 12, 1914.

New business continues to move slowly. Recent inquiries have not developed into orders freely, possible buyers apparently awaiting general developments in business. Indications point to a more active movement in power equipment, considerable building involving such installations being in contemplation. Railroad buying of tool equipment has been unimportant. The second-hand machinery trade continues dull. Little business has been moving in special machinery equipment for export. The foundry trade reports a slight improvement in demand, but on the whole business is dull and irregular.

Ballinger & Perrot, engineers, will prepare plans for a boys' industrial school to be built at White's Ferry, Pa., near Wilkes-Barre. The buildings will include a two-story main building, a chapel and a power house. Industrial shops are to be located in the basement of the main building. The power plant will require boilers, engines and electric light generators.

The Consolidated Belting Company, Philadelphia, has been incorporated with a capital stock of \$50,000, to manufacture transmission belting and leather specialties. Details as to plans are not available. Frank J. Torchiana, Moylan, Va.; E. T. Toogood, Orange, N. J., and E. A. Usina, Philadelphia, are the incorporators.

The Cresson-Morris Company, founder and machinist, will hold a meeting of its stockholders at an early date, with a view of reducing its authorized capital. Details of the company's plans are not made public. The company was formed some time ago by

the consolidation of the George V. Cresson Company and the Morris Engineering Company.

The Henry A. Hitner's Sons Company, Huntingdon street and Aramingo avenue, Philadelphia, has purchased the entire railroad and power plant of the Danbury & Harlem Railroad Company. The intention of the syndicate which started this project was to complete a trolley road from Danbury, Conn., to New York; the first portion under construction was about 16 miles, of this seven miles was completed when litigation stopped the work and it was not again resumed. It is probable that the purchaser will dismantle the entire road.

John G. Brown, engineer, Witherspoon Building, has been engaged to plan a three-story brick and concrete warehouse, to be erected on Commerce street above Fifth street for the Supplee-Biddle Hardware Company. Bids are to be taken at an early date.

The A. H. Fox Gun Company has taken bids for a two-story addition, 50 x 90 x 30 ft., with steam heat, metal sash and metal lath, to be built at its plant at Eighteenth and Windrim streets. The company states that it will not be in the market for power or machinery equipment, as the additional space will be used to relieve present overcrowded quarters.

Plans are in progress by George Pfeifer, engineer, Camden, N. J., for a waterworks plant to be built and equipped for the city of Wildwood, N. J. Detailed plans are not yet completed.

It is currently reported that the Edison Electric Light Company, Mt. Carmel, Pa., is contemplating an addition to its present power plant. William Keiser is named as superintendent of the plant.

It is stated that the Shohola Falls Hydroelectric Company, Milford, Pa., is contemplating the erection of a hydroelectric plant, on the Delaware River, near Belvidere, N. J.

The borough of Riverton, N. J., will shortly take bids for the construction of a sewage disposal plant. Plans have been completed by J. Haines, engineer, Burlington, N. J. Particulars may be obtained from J. H. Reese, Riverton, N. J., or G. W. Fuller, consulting engineer, New York.

The Breakwater Company, whose machine shop at Bellevue, Del., was recently destroyed by fire, has been adjudged a bankrupt. The company engages in contracting work and has a number of contracts with the Government. H. W. Moore, William E. Woods and R. R. Freed are understood to have been appointed receivers.

Bids are going in on an eight-story brick, steel and concrete warehouse, 196 x 263 ft.; elevators, heating and lighting being reserved, for the Baltimore Bargain House, Baltimore, Md., from plans by Joseph E. Sperry, architect, Baltimore, Md. Specifications call for metal lath and steel sash.

Chicago

CHICAGO, ILL., January 12, 1914.

The local machinery trade has shared in the prospect of better business since the first of the year, and reports of increased inquiry are quite general. The past week the sale of machinery out of Chicago stocks has been active. Second-hand machinery in particular has been in demand, and a very satisfactory number of sales were made. An absence of inquiry for individual lots of tools of any considerable size is still a somewhat disappointing feature.

E. R. Harris & Co., Chicago, have incorporated with a capital stock of \$2500 to manufacture and sell machinery. Incorporators are E. R. Harris, R. A. Taylor and L. J. McGinnis, Maywood, Ill.

The Decker Bros. Company, Chicago, piano manufacturer, suffered a loss to its plant estimated at \$100,000 as a result of fire.

Holmes, Pyott & Co., 159 North Jefferson street, Chicago, iron founders, have taken out a new charter providing for a capital stock of \$200,000. They have under development extensive plans for the enlargement of operations.

Bear Bros., 108 East South Water street, Chicago,

interested in bakers' supplies, have organized the American Bake Oven Appliance Company to manufacture heating appliances, with a capital stock of \$1000.

The Cassidy-Fairbank Company, 6126 South LaSalle street, Chicago, has acquired the business and plant of the East Side Foundry Company, South Chicago, which will be consolidated with its own main works. To the regular lines of foundry work now conducted a specialty will be added of non-corrosive white metal.

The O. W. Roberts Company, 231 West Grand avenue, Chicago, has been incorporated with a capital stock of \$10,000 for the purpose of manufacturing machinery and implements.

The Steel Stamping Company, Chicago, has been incorporated with a capital stock of \$15,000. The company may be addressed in care of E. A. Zimmerman, attorney, 155 North Clark street.

The Paulissen Mfg. Company, Kankakee, Ill., has been organized with a capital stock of \$60,000 for the manufacture of mill work and interior finish. John Paulissen, L. P. Clodi and Andrew Paulissen are the incorporators.

The Gibson Canning Company, Gibson, Ill., has been incorporated with a capital stock of \$225,000 by J. W. McCall, J. H. Collier and E. M. Atkinson.

The Danville & Eastern Illinois Railway Company has filed a mortgage for \$250,000 at Bloomington, Ill., and will use the funds in adding power and other equipment. It is a part of the Illinois Traction system.

The Washington-Crosby Milling Company, Kalispell, Mont., contemplate the installing of new machinery which will increase the capacity of the plant from 800 to 1000 bbl. per day.

The Champaign County Electric Company, Urbana, Ill., has been incorporated with a capital stock of \$16,000 to manufacture electric light and power. The capital is nominal and will be increased as the ultimate plans are developed by the company.

The Brocton Die Company, Brocton, Ill., organized by John Keijar, John Larson and William Anderson, with a capital stock of \$2500, will manufacture dies, tools and light machinery.

The Joliet Forge Company, Joliet, Ill., has been incorporated with a capital stock of \$80,000 by J. J. Sharpe, and others, to do a general forging business.

C. P. Taylor, Rockford, Ill., pattern maker, has acquired the plant formerly occupied by the Forest City Creamery and will remodel and equip the building as a pattern shop.

Mayor Sanders, Aurora, Ill., advises that plans are being perfected for the building of a power building for light manufacturing which will provide rental space for at least 20 manufacturing concerns at that city.

The J. B. Smith Mfg. Company, Peoria, Ill., has in contemplation the extension of its plant and the replacement of considerable of its machinery equipment with more modern tools.

The O. F. Jordan Company, East Chicago, Ind., has been organized with a capital stock of \$150,000 to engage in a machinery manufacturing business by J. H. Cummings, Jr., C. Y. Freeman and F. H. Wickett, 134 South LaSalle street, Chicago.

Plans for the extension of the Orient Railroad shops at Wichita, Kan., are being prepared by Westinghouse, Church, Kerr & Co., New York, which will very greatly increase their capacity.

The Dart Mfg. Company, Waterloo, Iowa, manufacturer of motor trucks, has secured a location and will build a new plant this year.

The Link Side-Bearing Company, Hammond, Ind., has been incorporated with \$100,000 capital stock, to manufacture railroad trucks. The directors are Joseph T. Hutton, George C. Locklin, Henry W. Marden, William S. Hutton and William J. Whinery.

The Southern Illinois Machine & Foundry Company, Murphysboro, Ill., has increased its capital stock from \$20,000 to \$50,000 for the purpose of increasing its manufacturing equipment and general facilities.

The supervisors of the Muscatine-Louisa drainage district, Muscatine, Iowa, will receive bids until January 22 for a steam driven drainage plant with three centrifugal pumps with a total capacity of 200,000 gal.

per minute against a head of 16 ft. The Harman Engineering Company, Peoria, Ill., is in charge.

Bids will be received by J. M. Schouweiler, city recorder, Wabasha, Minn., until January 27, for a complete waterworks system.

Bids will be received by the state board of health, Douglas, Kan., until January 20, for waterworks and a filtration plant.

Springfield, S. D., has voted \$10,000 for a municipal electric light plant.

Hardin, Mont., has voted \$41,600 issue of bonds for waterworks. B. C. Lillis, Billings, Mont., has prepared plans.

H. L. Raiff, Columbus, Mont., and E. S. Clarke, Billings, have incorporated the Northwestern Mill Construction Company. A large flour mill and two grain elevators will be erected at Billings.

Indianapolis

INDIANAPOLIS, IND., January 12, 1914.

The Carnahan Mfg. Company, Loogootee, Ind., has started work on the foundations for an addition to its wood-working plant at Loogootee, which will double the company's floor space and capacity. The company manufactures a patented door with air spaces and wood finish joined with rings. The equipment has been provided for.

Cook & Nading, Columbus, Ind., will establish a large ice factory, it is reported. The capacity of the plant will be 50 tons a day.

Burke G. Slaymaker has been appointed receiver for the American Insulating Company, manufacturer of mineral wool and other rock products, Alexandria, Ind. Frank Sawyer is manager of the company.

The Mitchell Lime Company, Mitchell, Ind., will install a hydrator in the lime plant.

The Ft. Wayne Miniature Lamp Company, Ft. Wayne, Ind., has been incorporated with \$5000 capital stock to manufacture electrical machinery. The directors are A. G. Locke, W. C. Glass and E. L. Locke.

The Central Boiler & Sheet Iron Works, Indianapolis, has been incorporated with \$10,000 capital stock to manufacture boilers, tanks, etc. The directors are F. J. Schneider, M. P. Herter and M. N. Schneider.

The Leader Specialty Company, Indianapolis, has been incorporated with \$40,000 capital stock to manufacture plumbing specialties. The directors are C. J. Mick, W. M. Eastman and E. T. Eastman.

Robbins, Schildmeier & Co., Indianapolis, has been incorporated with \$10,000 capital stock to engage in general engineering and construction. The directors are M. E. Robbins, H. C. Schildmeier and E. Y. Brown.

The Wizard Motor Company, Indianapolis, has been incorporated with \$50,000 capital stock to manufacture motor cars. The directors are Edward H. Habig, O. C. Forbes and P. S. Florea.

The National Shade Roller Mfg. Company, Warsaw, Ind., has been incorporated with \$25,000 capital stock to manufacture window shade rollers. The directors are E. Hayslett, J. W. Webber and W. E. Nelson.

The E. A. Martens Company, Lafayette, Ind., has been incorporated with \$10,000 capital stock to manufacture lubricating devices for gasoline engines. The directors are E. A. Martens, M. W. Broadie and W. R. Prass.

The Indiana Fertilizer & Stone Company, Kingman, Ind., has been incorporated with \$50,000 capital stock, to manufacture fertilizers and road materials. F. Scott Booe, J. A. Copeland and C. M. McCabe are the directors.

It is reported that a plant covering four blocks will be built at Evansville, Ind., in the spring by the International Steel & Iron Construction Company of that city and the building of bridges will be added to its other manufacturing lines.

The Inner Braced Furniture Company, Elkhart, Ind., has been organized to take over the Inner Braced Furniture Company, of Schoolcraft, Mich. The company has erected a plant with about 100,000 sq. ft. of floor space under roof at Elkhart. The main building is two-story brick, hollow wall, built to support a third

story, and is supplied with sprinkler system. The company manufactures patented continuous steel reinforced furniture and has recently installed a number of new machines. The original factory at Schoolcraft, Mich., is still retained. B. D. Nichols is secretary.

Milwaukee

MILWAUKEE, WIS., January 12, 1914.

Optimistic statements now being issued by business men, bankers and manufacturers with regard to an early resumption of prosperous conditions have gone a long way toward re-establishing confidence here, and there are a number of concrete examples of actual and sound improvement. Railroad retrenchment has affected Milwaukee metal industries particularly because of their nature, and it is greatly hoped that freight rates may be advanced. H. B. Earling, vice-president of the Chicago, Milwaukee & St. Paul Railway Company, said in Milwaukee on January 9: "If business conditions on our lines continue to show the improvement in the next few weeks as in the first days of the new year, there will be plenty of work in the car and locomotive shops at Milwaukee." Pay-rolls generally are being slowly increased. Collections are improving and the bankers have made it somewhat easier for borrowers. The Westinghouse interests have been negotiating for several weeks for a plant in Milwaukee and have made an offer for the Kissel Motor Car Company's Milwaukee factory group at Thirty-second and Center streets. They propose to start operations here May 1 and employ 2500 men. President Kissel, of the motor car company, said to *The Iron Age* representative: "Whether or not we relinquish this plant to the Westinghouse people depends entirely upon other negotiations pending, and which, if terminated, mean a further extension of the business of the Kissel Motor Car Company. We cannot discuss our plans in detail at present, but you can say that if this plant is given up it will mean a further expansion of our manufacturing facilities."

The Rutz Gas Specialty Company, Milwaukee, has been incorporated with \$10,000 capital stock to manufacture illuminating and regulating devices. The incorporators are Albert O. Rutz and Julius F. Rutz, officials of the Rulu Lighter Company, of Milwaukee, and C. G. Nehring.

The contract for structural steel and iron work on the new baking plant of the M. Carpenter Baking Company, Seventh street, Milwaukee, was awarded to the Heil Company, Milwaukee. The plant will cost \$125,000.

The Brand Stove Company, 303 Sixth street, Milwaukee, is preparing to build an addition and renovate its present plant. The principal product is gas ranges. William F. Hyde is president.

Plans are being prepared for a six or eight-story steel and brick store and warehouse building for Alfred F. James, at 382-384 East Water street, to be occupied by the Goodyear Rubber Company's Milwaukee branch.

The Hartland Mfg. Company, Hartland, Wis., recently reported incorporated, is in the market for molding machines and wishes prices on malleable castings. The company manufactures metal trace fasteners for horse-drawn vehicles. Address T. A. Bakker.

The village of Sheboygan Falls, Wis., has issued \$49,000 in municipal bonds for the construction of a waterworks system and electric light and power plant.

The Hartmann-Greiling Company has purchased the property and business of the Burns Boiler Company, Green Bay, Wis. The plant will be dismantled and the equipment added to the Hartmann-Greiling main shops.

The Hannahs Mfg. Company, Kenosha, Wis., furniture maker, will expend about \$75,000 in building a new power house, machine room and four new automatic dry kilns. The new power plant will be electrical and will replace the present steam power plant. L. T. Hannahs is president.

The R. Heger Brewing & Malting Company, Jefferson, Wis., is building an addition to its power plant and will install another engine and a compressor. Herman Boettcher is general manager.

The Marinette Packing Company, Marinette, Wis., has purchased a site for a packing and cold storage

plant to cost \$25,000. The concern recently was incorporated with a capital of \$50,000.

The Badger Steel Roofing & Mfg. Company, La-Crosse, Wis., has increased its capital stock from \$20,000 to \$100,000. Important enlargements are to be made, but definite plans are not yet ready for publication.

Agitation has been started at Neenah, Wis., for the establishment of a municipal electric light and power plant. The city's contract with the Wisconsin Traction, Light, Heat & Power Company expires late this year.

Well-defined rumors are current at Racine, Wis., that a large Eastern gasoline motor interest is negotiating for the purchase or lease of the large engine plant of the Wisconsin Engine Company, bankrupt, at Corliss, Racine County. The company is specializing in power boat work, but the name is withheld for the present. The plant has been idle a year.

Application has been made by C. M. and J. M. Arnquist, of Wausau, Wis., for authority to build a 400-ft. power dam on the Apple River, near Star Prairie, St. Croix County. It is proposed to furnish current to the cities of Hudson, New Richmond, Boardman and Somerset.

The Hannahs Mfg. Company, Kenosha, Wis., has prepared plans which will double the present capacity of its factory. A machine shop will be included.

Detroit

DETROIT, MICH., January 12, 1914.

While conditions the past week have shown no material change from those prevailing for some time, the general feeling among local machine tool merchants seems to be more cheerful and the hope is freely expressed that the worst of the dull period is over. No large sales are reported, but there has been a fair number of orders for single tools and some new inquiry is before the trade. There is some new inquiry for power plant equipment and electrical machinery of the smaller types. The second-hand machinery market continues dull. Little new construction work is appearing, but contractors are generally busy.

The Ford Motor Company, Detroit, is planning the erection of a new power plant. The building alone will cost \$150,000 and with its equipment will represent an investment of about \$1,000,000. The contracts for the engines and dynamos have already been awarded.

The Signal Motor Truck Company, Detroit, has been incorporated with \$60,000 capital stock to manufacture automobile trucks and has commenced operations in a moderate way. The incorporators are John Squires, A. C. Burch and R. M. Wendell.

The Johnson-Slocum Company, Caro, Mich., manufacturer of steel specialties, is adding a department for the manufacture of sheet metal specialties. F. A. Smith will be in charge of the new department.

J. J. Middleworth, Duffield, Mich., and others, have purchased the tile manufacturing business of W. H. H. Smith & Sons at St. Louis, Mich. The purchasers propose to install additional equipment and erect new kilns and driers.

The Acme Surgical Instrument Company, Bay City, Mich., has been incorporated with \$25,000 capital stock to manufacture veterinary instruments. Frank G. Laing is president. The company's products will be manufactured on contract at present.

The Commonwealth Power Company, Jackson, Mich., has petitioned the Michigan Railroad Commission for permission to issue bonds for \$346,000 for extensions and improvements to its subsidiary plants as follows: Saginaw Power Company, \$10,000; Consumers' Power Company, \$69,000; Economy Power Company, \$133,000; Au Sable Electric Company, \$87,000; G. R. & M. Power Company, \$29,000; Commonwealth Power Company, \$18,000.

The Munising Paper Company, Munising, Mich., will install new power plant machinery and miscellaneous equipment to the extent of \$30,000.

The United States Pipe Company, Battle Creek, Mich., manufacturer of drain pipe, will remove its busi-

ness to Bay City, Mich., where a larger plant will be erected.

Cincinnati

CINCINNATI, OHIO, January 12, 1914.

As a rule, merchants and manufacturers are entering the new year with a much more hopeful feeling. Looking backward, many of them have no particular complaint with the total results of last year. Disastrous floods which shut down many plants for several weeks were followed by labor troubles in the summer which greatly hindered factory building operations. One encouraging feature of the present situation is the general rumor circulated that the railroads are on the verge of entering the market for shop equipment of all kinds. The export business in machine tools continues quite dull, and this branch of the trade is not expected to revive before the spring season. Second-hand machinery is in better demand, and most of the jobbing foundries report a little more activity. Nearly all manufacturing plants closed down a full week during the holidays. They are all now in operation, but with reduced forces.

The Victor Auto Parts Company, Cincinnati, manufacturer of automobile lamps and other specialties, has acquired a site at Winton place on which will be erected a factory building having about 50,000 sq. ft. of floor space. The company's present factory is at Second and Elm streets, and the contemplated move will enable it to more than double its output. Considerable special machinery equipment will be required later.

It is reported that the Doepeke Company, First National Bank Building, Cincinnati, has tentative plans under way for a large garage to be constructed in Avondale. In addition to heating equipment refrigerating machinery will be required.

It is announced that the Ford Motor Company, Detroit, Mich., has abandoned its plans for establishing an assembling plant in Cincinnati, mention of which was recently made.

The Le Momtree Hanger Works Company, Cincinnati, has leased a factory building at 1908 West Eighth street, which will be fitted up for manufacturing household specialties. Only a small amount of equipment will be needed.

The Meter Valve Carbureter Company, Dayton, Ohio, has been incorporated with \$20,000 capital stock to manufacture automobile accessories. George W. John is named as one of the principal incorporators.

The Olmstead Metal Products Company, Olmstead, Ohio, is a new incorporation with \$30,000 capital stock to manufacture hardware specialties.

The Stoddard-Dayton-Maxwell Repair Company, Dayton, Ohio, recently incorporated with \$10,000 capital stock, will fit up a general repair shop for automobiles. B. A. Rhodes and W. I. Glasby are named among the incorporators.

The Reick Sheet Metal Company, Dayton, Ohio, will rebuild its plant that was partially destroyed by fire December 29. The loss was approximately \$8000, fully covered by insurance.

The city of Columbus, Ohio, will soon advertise for bids on the necessary equipment for increasing the capacity of the municipal waterworks.

The Dayton Tool & Die Company, Dayton, Ohio, has been incorporated with \$10,000 capital stock to deal in machinery of all kinds. F. P. Chamberlain and E. Mitchell are among the incorporators.

The Urbana Engineering Company, Urbana, Ohio, Richard Johns, manager, is fitting up a machine shop for making small tools and dies, as well as to do general automobile repairing. Practically all the necessary equipment has been purchased.

The Mead Pulp & Paper Company, Chillicothe, Ohio, is having plans prepared for a two-story machine shop that will be 65 x 250 ft., of regular mill construction.

D. H. Martin will establish a plant at Gladys, W. Va., for the manufacture of hubs.

The Crystal Block Mining Company, Gary, W. Va., has been incorporated with \$200,000 capital stock by Howard N. Evanston, L. E. Woods, J. J. Stout, and others, of Gary, W. Va.

Cleveland

CLEVELAND, OHIO, January 12, 1914.

Some single tool business is coming out, but there is little inquiry for small lots of machinery. However, the improvement recently noted in sentiment continues both among the machinery trade and manufacturers in metal working lines. A Cleveland machinery house offering a large amount of second-hand machinery from automobile plants reports a good volume of inquiry for that machinery from various parts of the country. Makers of turret lathes are fairly busy on old orders. In general lines some good inquiry has recently come out for coal-handling plants. In the foundry trade the demand for castings continues quiet.

The M. Richard Automobile Company, Cleveland, has been incorporated with a capital stock of \$250,000 to place a new automobile on the market. The company plans to rent a temporary factory and to shortly begin the erection of a plant. Options have been obtained on several sites.

The Falcon Motorcycle Company, recently organized in Cleveland, will establish a plant in Staunton, Va., and is in the market for a complete outfit, including lathes, shapers, milling machines, drills, etc.

The Cleveland-Akron Bag Company, Cleveland, will erect a six-story plant at Perkins avenue and East Fortieth street for the manufacture of awnings.

N. E. Warwick will erect a new factory building on East Fortieth street near Kelly avenue, Cleveland.

The Standard Motor Truck Company, Warren, Ohio, is fitting up a machine shop in connection with its assembling plant recently established.

The City Machine & Tool Company, Toledo, Ohio, has been incorporated with a capital stock of \$50,000 by Isaac Kinsey, L. P. Kinsey, F. L. Mulholland, Charles Hartman, and others.

The New London Mfg. Company, New London, Ohio, has been incorporated with a capital stock of \$25,000 by H. W. Townsend, B. F. Harrison, Fred Biglow, and others.

To take care of an expansion in its business the Timken-Detroit Axle Company, Canton, Ohio, has plans under way for increasing its capital stock from \$1,000,000 to \$3,000,000.

The Federal Clay Product Company, Mineral City, Ohio, is planning the installation of a 1000-hp. electric power plant and is in the market for boilers, motors and other equipment.

It is announced that the plans of the American Stamping & Enameling Company to move its plant from Bellaire to Massillon, Ohio, have been abandoned and that instead a new branch plant will be built in Massillon for the manufacture of enamel ware. It will be housed in a building 200 x 300 ft.

The Lorain Crystal Ice Company, Lorain, Ohio, will build a new storage warehouse and install refrigerating machinery.

The Central South

LOUISVILLE, KY., January 12, 1914.

The feeling among machinery men shows a distinct improvement. Boiler makers report that a larger number of inquiries are being received, while the manufacturers of electrical equipment are also enjoying good trade. The demand for machine tools has shown unusual activity of late, and altogether the prospects are regarded as better than for a long time. Certain special lines, such as ice and refrigerating machinery, are moving better, and improvement is shown all along the line. Most of the members of the trade feel that the beginning of a new year has brought renewed confidence to business men and that orders which have been held back are now coming to the front.

The Henry Vogt Machine Company, Louisville, has purchased a pinning press for its drop forging department from the Toledo Machine & Tool Company. The company reports improvement in the demand for both boilers and ice machines.

The James Clark, Jr., Electric Company, Louisville, has received an order from the Navy Department for a considerable number of motor-driven direct-connected machine tools for installation on the destroyed tender Melville. The demand for machine tools, as well as for electrical equipment, is reported to show improvement.

George E. Woodruff & Co., Louisville paint dealers, are considering entering the manufacturing business and expect to be in the market for motors, paint grinders and mixers, etc.

The American Metallic Company, Lexington, Ky., is in the market for a second-hand locomotive.

The Thomas Company, Lexington, Ky., is planning to take over the business of the Lexington Woodenware Company and to equip a plant for the manufacture of brooms.

The Ohio Valley Pulley Works, Maysville, Ky., has acquired an interest in the Oneida Steel Pulley Company, Oneida, N. Y., and its subsidiary, the Keystone Pulley Company, Oneida, and will handle the sales of the latter company over a large part of the South and Southwest.

The Madisonville & Nortonville Light, Power & Traction Company is being organized at Madisonville, Ky., for the purpose of building and operating an inter-urban traction line. A power plant will be built at Madisonville. James Breathitt, Hopkinsville, Ky., is one of the promoters of the proposition.

The Pineville Coal Company, Pineville, Ky., has been organized with White L. Moss as president, and will open several new mines in that section, requiring machinery in the immediate future.

The Pleasureville Automobile Company, Pleasureville, Ky., is building a garage and will probably need machine tools for its repair shop.

The Barbourville Electric Light & Power Company, Barbourville, Ky., is planning to enlarge and improve its plant, and has asked the city to create a new franchise covering the improvements which it intends to make.

The Mayfield Woolen Mills, Mayfield, Ky., has announced that a considerable amount of new machinery will be installed in its branch factory at Paducah, Ky. Harry Wright is local manager at Paducah.

Henry Nelson, Winchester, Ky., has announced plans for the development of a coal mining property in Harlan County, Ky., and will be ready to purchase the necessary power and special equipment in the near future.

The Bransford Mills, Owensboro, Ky., has been incorporated with \$50,000 capital stock by C. W. Bransford and others, and plans the erection of a flour mill and grain elevator, for which power and conveying equipment will be needed.

The Board of Prison Commissioners, Frankfort, Ky., will establish a shoe factory at the reform school at Greendale, Ky., and will purchase the equipment shortly.

The Self-Lock Gate Company, Morganfield, Ky., has increased its capital stock from \$12,000 to \$30,000 for the purpose of increasing its plant equipment.

The Jones-Savage Lumber Company, Wilmore, Ky., has been incorporated with a capital stock of \$18,000 and will equip a mill.

A plant for the manufacture of button blanks, with an installation of motors, shell crushing machinery, conveyors, etc., will be equipped at Memphis, Tenn., by the Pioneer Pearl Button Company. H. W. Huttig is president, Poughkeepsie, N. Y.

Steam and electric power will be installed in the new plant of the Chattanooga Armature Works, Chattanooga, Tenn.

The Chattanooga Oxygen Gas Company, Chattanooga, Tenn., has been incorporated with a capital stock of \$20,000 by A. W. Chambliss, O. M. Faulkner and S. R. Roddy to equip a plant for the manufacture of oxygen, etc.

The Mayland Coal & Coke Company, Mayland, Tenn., has been incorporated with a capital stock of \$50,000 by J. S. Cline, C. H. Sells, T. F. Brown, and others.

The Kentucky Coal & Iron Company, Chattanooga, Tenn., has been incorporated with a capital stock of

S. D. SCHER & SONS,
Mechanical and Civil Engineers,
PITTSBURGH, PA.

\$100,000 by James Adams, O. P. Darwin, J. H. McCallum and others.

The municipality has purchased the plant of the Halls Light & Water Company, Halls, Tenn., and will make extensive improvements. Address the mayor.

The Lucas & Smith Elevator & Mfg. Company, Chattanooga, Tenn., has been incorporated with \$10,000 capital stock and will continue the business of the G. W. Lucas Elevator & Mfg. Company.

The Dickson Planing Mill Company, Dickson, Tenn., is reported to have plans for the enlargement of the capacity of the plant.

The Nashville Creamery Mfg. Company, Nashville, Tenn., has completed the equipment of its plant. The company has installed a power plant and is making its own electric current, the special equipment being motor-driven. Compressors, refrigerating machinery and other equipment are used. W. J. Reeves is manager of the company, which will be in the market for accessories and supplies from now on.

The City Commissioners of Nashville, Tenn., will equip a quarry on Meridian Hill.

Washington, N. C., has completed plans for the improvement of its water and electric light plants. The improvements will cost over \$100,000. G. C. White, Charlotte, N. C., is the engineer in charge.

John H. Kuck, Wilmington, N. C., has announced plans for the establishment of a hosiery mill. A steam power plant will be needed.

Latta, S. C., has announced plans for the establishment of a waterworks system at a cost of \$20,000. The power plant will contain two 80-hp. boilers, feed pump and heater, three pumps and accessories.

The Dawson Light & Power Company, Dawson Springs, Ky., will change the electric equipment of the Dawson Milling Company, which it is taking over at a cost of about \$15,000.

The Baily Dental Specialty Company, Memphis, Tenn., has been incorporated with a capital stock of \$25,000 by E. A. Johnson, William Bailey, Jr., and Lawrence Mayer, and will equip to manufacture dental specialties.

The S. R. Biggs Iron & Motor Company, Williams- ton, N. C., has been incorporated with a capital stock of \$25,000 by S. B. Biggs, J. W. Biggs, and others, to take over the business of J. L. Wallord & Co., manufacturers of harrows, cultivators, stove pipe, etc. S. R. Biggs is president; W. H. Biggs, secretary and treasurer; J. W. Biggs, vice-president.

The Victor Cotton Oil Company, Yorkville, S. C., will rebuild the structure recently burned.

The School Board, Fairfield, Va., is in the market for a 50-hp. boiler and a 40-hp. engine. J. B. Dowden is clerk of the board.

The W. P. Brown & Sons Lumber Company will install a dry kiln at its sawmill at Fayette, Ala. The company's main office is at Louisville, Ky. Address T. M. Brown.

The Shook & Fletcher Supply Company, Birmingham, Ala., has taken over the business of Shook & Fletcher, and will deal in sawmill equipment, including logging machinery, etc.

Within a few weeks Brewton, Ala., expects to purchase one 150-kw. generator, one 4-valve engine, directly connected to generator, one 175-hp. boiler and one electrically operated pump. Address D. B. Hayes, city clerk.

Leesburg, Ga., is planning the installation of an electric light plant. A 100-hp. boiler, engine and other equipment will be installed. The J. B. McCrary Company, Atlanta, Ga., is designing the plant.

The Schuh Mason lumber mill at Selma, Ala., was damaged by fire to the extent of \$10,000. New machinery will be installed.

The Georgia Showcase Company, Columbus, Ga., whose plant was recently reported burned, will rebuild. The cost of the new plant will be about \$75,000.

The Bowling Green Electric, Water & Power Company, Bowling Green, Fla., recently incorporated, will build electric, water, ice and cold storage plants. Machinery will be purchased in January. Charles Auld is president of the company.

The Chipley Light & Power Company, Chipley, Fla., is reported to be in the market for a 50-kva. 2300-volt alternator, with steam engine.

St. Louis

ST. LOUIS, Mo., January 12, 1914.

Inquiries continue to increase in number and dealers are generally reporting improvement over the recent past. A feeling prevails that within a short time there will be a better movement of business than for months past. Transactions are increasing slightly, but the new inquiries have not, for the most part, been in hand long enough to mature into actual business. Reports from the territory surrounding St. Louis indicate that there is a disposition to consider new enterprises as well as the extension of old ones, particularly as the capital and credit situation has been materially improved by the final settlement of the currency legislation. The outlook for spring business is regarded as good. Collections on such business as is moving is reported satisfactory. Second-hand tools are rather quiet.

The Polar Wave Ice & Mfg. Company, St. Louis, has begun work on a branch factory to cost with equipment a total of \$250,000.

The Kahn Mirror Plate Company, St. Louis, has leased new quarters and on removal will increase its mechanical facilities.

The Continental Brass & Foundries Company, St. Louis, has been incorporated with a capital stock of \$25,000 by Ferdinand Messmer, of St. Louis; G. D. Klemme, of Belleville, Ill., and Joseph Messmer, of Kirkwood, Mo., to manufacture brass and other metal goods.

The American Electric Smelting Company, St. Louis, has changed its name to the Greene Process Metal Company and will, it is stated, increase its facilities.

The Crescent Oil & Supply Company, St. Louis, has been incorporated with a capital stock of \$10,000 by William H. and Dwight F. Babcock and C. Oliver Ramsdell to manufacture oils, paints, etc.

The Hamilton Mining, Milling & Timber Company, St. Louis, has been incorporated with a capital stock of \$150,000 by A. B. and M. E. Hamilton, P. L. Crawford, J. H. Roach and P. R. Papin to develop mineral property which they control.

The Acme Truck & Tool Company, St. Louis, has taken title to a large tract adjoining its present plant near Jennings Station, St. Louis County, and plans an extension.

The Acme Fireproofing & Contracting Company, St. Louis, has been incorporated with a capital stock of \$10,000 by J. J. Clark, S. A. Walker, E. H. Wischer, and others, to manufacture fireproof hollow building tile.

The Retzbach Ice Cream Bricking Machine Company, St. Louis, has been incorporated with a capital stock of \$10,000 by E. J. Retzbach, Clement A. Dierkes and John H. Bruninga to manufacture confectionery machinery.

The Central Cigar Box Company, St. Louis, has been incorporated with a capital stock of \$15,000 by A. Klinkenspor, F. M. Erb, L. J. Schuttenheim, H. E. Graeff and H. G. Dieckmeyer to manufacture cigar boxes.

The Shiras Electric Company, St. Louis, has increased its capital stock from \$10,000 to \$40,000 for the purpose of extending its manufacturing and contracting operations.

The Connells-ville Coal & Mining Company, Connells-ville, Mo., has been incorporated with a capital stock of \$15,000 by C. W. Evans, Marion C. Miller and S. F. Shoop to engage in coal mining.

The Schofield Laboratories Company, Kansas City, Mo., has been incorporated with a capital stock of \$50,000 by George L. and C. L. Schofield and E. J. Geitmann to engage in the manufacture of chemical products.

W. L. Diffenderfer, Lebanon, Mo., has been granted a franchise to equip an electric light plant at Richland, Mo., and is in negotiation for a similar franchise at Dixon, Mo. He will be in the market shortly for equipment.

The managers of the State Hospital No. 4 at Farmington, Mo., will remodel the ice and refrigerating plant

at the institution. H. H. Hohenschil, St. Louis, is the architect and engineer.

The Quaker Maid Mining Company, Frisco Building, Joplin, Mo., will develop lead and zinc property which it owns to a daily production of 100 tons. Equipment has not been bought.

W. E. Mismar, Albany, Mo., will build a bottling plant and is reported in the market for the equipment.

The Newro Gin Company, Argenta, Ark., has been incorporated with a capital stock of \$17,700 by Ben D. Schaad, Lindsey Roberts, and others, and will equip a cotton gin.

The Crossett Lumber Company, Crossett, Ark., has increased its capital stock from \$600,000 to \$1,000,000 for the purpose of extending its milling facilities, etc.

Mills for the manufacture of lumber, staves and heading are to be established near Bayou Meto, Ark., on property recently acquired by the Henry Wrape Company, St. Louis, which is reported in the market for the necessary equipment.

An 8-band sawmill is to be equipped at Factoria, Ark., by the Homer I. Cutsinger Lumber & Veneer Company, Chamber of Commerce, Little Rock, Ark.

The J. K. Siphon Ventilator Company, Little Rock, Ark., has been incorporated with a capital stock of \$100,000 and will extend its plant.

The city of Osceola, Ark., will expend \$16,000 on a waterworks plant under the supervision of the mayor.

The Pulaski Cooperage Company, Little Rock, Ark., will rebuild the plant which was recently burned. Its present offices are in the Third National Bank Building, St. Louis.

M. L. Sigman, Benton, Ark., has plans for the equipment of a tight barrel stave plant at Monticello, Ark.

The Claco Mining Company, Poteau, Okla., recently incorporated with a capital stock of \$50,000 by F. L. Mercer and C. G. Weise, Poteau; Ed. Hayes, Witteville; Hugh Dook and J. T. Roland, Milton, and L. S. Bayrell, Frederick, will open a new coal field.

The Apache Oil & Gas Company, Lawton, Okla., recently incorporated with a capital stock of \$50,000, is in the market for drilling machinery and will do its own development work.

The C. R. H. Oil & Gas Company, Oklahoma City, Okla., will open bids February 1 for machinery for drilling purposes and will develop its own property. It is incorporated with a capital stock of \$40,000. H. Ernest Rowe is the engineer.

The Knox Oil & Gas Company, Perry, Okla., has plans to equip with its own drilling machinery for the purpose of sinking eight wells. George H. Manser is in charge.

The Westville Lumber & Mfg. Company, Westville, Okla., has been incorporated with a capital stock of \$15,000 by O. L. Reeves, L. G. Bowman, Enoch Hughes and W. G. Pritchard, and will install a mill.

J. B. Newton & Son, Inc., Poplarville, Miss., has been incorporated with a capital stock of \$10,000 by J. B., R. M. and I. S. Newton to equip and operate sawmills, manufacture turpentine, etc.

The R. B. Morris Lumber Company, Mt. Olive, Miss., will equip a mill of 50,000 ft. daily capacity and will also install a planing mill with matchers and surfacers as well as steam dry kilns.

The Bayou Rapides Lumber Company, Alexandria, La., will increase its capital stock from \$125,000 to \$250,000 for the purpose of extending its manufacturing operations.

The Link, Newcomb & Hall Lumber Company, Jonesville, La., reported incorporated last week, will install about \$8000 of equipment for the manufacture of about 25,000 ft. daily of red gum and other timber.

The Bomer-Blanks Lumber Company, Livonia, La., will increase its capital stock for the purpose of extending its mechanical equipment.

The American Spring & Mfg. Company, New Orleans, La., H. P. Hudson and others interested, will equip a plant for the manufacture of bed and cot springs, with a daily capacity of 300 springs.

The O. K. Knitting Mills, New Orleans, La., capital \$25,000, with S. Orsher, N. Kronengold and A. Radlauer, of New York, interested, will equip a mill with 25 machines for the manufacture of sweaters.

A plant for the manufacture of handles, oars, etc., is to be equipped at New Orleans, La., by the Anchor Saw Mills, of Memphis, Tenn.

The Louisiana Handle Factory, Shreveport, La., has been incorporated with a capital stock of \$15,000 by J. B. Atkins, S. A. Guy and W. E. Payne and will equip a plant in the near future.

The Coleman Lumber Company, Logansport, La., is planning the installation of machinery sufficient to increase the capacity of its sawmill from 20,000 to 70,000 feet a day.

Texas

AUSTIN, TEXAS, January 10, 1914.

The machinery and tool trade has changed little the past week. Quiet prevails in all lines, but with no trade depression. A number of industrial plants of small size will be in the market for machinery, but there have been no large projects announced for the immediate future, except those formulated late in 1913.

The Tyler Traction Company will soon begin work on the erection of its machine shops and repair departments at Tyler. The contract has already been let for a large car barn.

The San Diego electric light plant has been sold by S. G. Smith to Arthur Blankenship, who will make a number of improvements.

The Texas City Electric Light & Water Company is enlarging and improving its waterworks plant, increasing the capacity of the plant to 1,488,000 gal. daily.

The waterworks and electric light bonds voted by Aransas Pass, Tex., on December 1, \$30,000, have been sold and construction will be commenced as soon as the funds are available.

A new steam laundry plant costing \$10,000 will be erected at San Benito by A. J. Joyce.

The Farmers' Gin Company, Otto, Falls County, has increased its capital stock from \$7000 to \$15,000 and will enlarge the capacity of its cotton gin.

The Shallow Water Land Company has been organized at Deming, N. M., to develop a tract of land by shallow well irrigation. The company has a capital stock of \$100,000. The directors are Joseph A. Mahoney, Amos W. Pollard and Charles E. Miesse.

The Pangburn Ice Cream Company, Fort Worth, has been incorporated with a capital stock of \$15,000 by H. T. Pangburn, Harry Gutzman and D. M. Kent to erect an ice cream manufacturing plant.

The Water Users' Association, Tempe, Ariz., has let the contract for the building of the concrete foundations for the new Crosscut power house, across the Salt River from Tempe, to Martin & Gillis, of Tempe, for \$34,000. The water wheels and feed pipes will be imbedded in the concrete.

The Pacific Northwest

PORTLAND, ORE., January 6, 1914.

While single-tool business is showing up fairly well for this time of year, nothing of special importance is appearing in the metal working line. Local dealers, however, look for a period of exceptional activity, beginning in the spring or early summer, as the increase already made in coastwise shipping and the great number of vessels to come through the Panama Canal will require a material increase of repair facilities at all Pacific ports. Lumbermen express a little more optimism for the future, but the outlook is not altogether assured. The possibility of shipping lumber to the Atlantic coast via Panama is under discussion, but prominent shipping men express doubt as to the outcome. Public improvements are still giving rise to considerable business in general machinery, and there is an increasing demand for fruit-handling and agricultural equipment in the interior. Numerous inquiries are also coming out for the enlargement of miscellaneous manufacturing establishments. The railroad shops in Tacoma, Seattle and Everett, Wash., are enlarging their forces, and the Chicago, Milwaukee & St. Paul is preparing to increase its shops and output at Tacoma.

The Pacific Furniture Specialties Mfg. Company, Portland, Ore., recently incorporated with a capital stock of \$100,000, plans to build a factory at East Twenty-seventh and Morgan streets. Electric power will be used.

James Lindsay, Portland, has secured permission to erect a 3500-hp. hydroelectric plant at Loon Lake, in the Siuslaw Forest Reserve. The construction involves three 1150-hp. turbines, operating under 263-ft. head. In connection with the plant, it is stated, a pulp mill will be built at an estimated cost of about \$200,000.

Fire recently destroyed the boiler house and engine room of the Bend Lumber Company's mill at Bend, Ore., with a loss of about \$5000. The buildings will be rebuilt and the machinery replaced at once.

The plant of the Central Oregon Ice & Cold Storage Company, Bend, Ore., was recently destroyed by fire with a loss of \$25,000. Insurance was carried and it is understood the plant will be rebuilt at once.

The Amunsville Flour Mill Company, Amunsville, Ore., is preparing to install a hydroelectric plant to supply light and power for the town.

The plant of the Vermont Marble Company, Tacoma, Wash., will shortly add new machinery, including three saw gangs.

The city of Spokane, Wash., is taking figures on an electric light plant for the municipal building.

The dry kilns and lesser important buildings belonging to the D. & M. Lumber Company at Lake Tapps, near Tacoma, Wash., were recently destroyed by fire, entailing the loss of approximately \$10,000. Demarest & Miller, Tacoma, are the owners. Insurance was carried and it is understood the buildings will be rebuilt at once.

The Clarke County Growers' Union will build a creamery in Vancouver, Wash., to cost not less than \$20,000. Active operations will begin the first of February.

The sawmill of Adams & Baldwin, Washougal, Wash., located at Sunset View, recently sustained a \$10,000 loss from fire. It is reported that the plant will be rebuilt at once.

Stock Bros., Seattle, Wash., have secured a site in Mt. Vernon, Wash., and will at once build a large sawmill.

The Spokane Woolen Mills Company, Spokane, Wash., has been incorporated with a capital stock of \$30,000 by Gordon C. Corbaley, G. L. Sawyer and Chas. Hebbard, Spokane. A site has been secured in the Parkwater district and work of erecting buildings will begin in the immediate future. John Nelson, Spokane, is the superintendent of construction.

The City Council, of Little Falls, Wash., has retained A. L. Richardson, engineer, Henry Building, Portland, to prepare plans and estimates for a waterworks system.

The Coeur d'Alene Hardware Company and the Coeur d'Alene Iron Works, Wallace, Idaho, have been merged in the Coeur d'Alene Hardware & Foundry Company, incorporated with a capital stock of \$500,000.

W. H. Hills and B. Gustad, New Meadows, Idaho, have secured a site on Little Salmon River for the construction of an electric light and power plant. Installations planned include concrete and timber crib dam, with wood stave pipe to the power house; a 327-hp. turbine, and a 250-kw. generator.

D. H. Biethan and others, Blackfoot, Idaho, have under contemplation the construction of a power plant on Warm River to generate 7000 hp. for supplying heat, light and power to the city of Blackfoot and other nearby cities.

The Panhandle Railway Company, Priest River, Idaho, will construct a power plant on the upper part of the Priest River for the purpose of supplying power to cities in the vicinity.

The Utah Power & Light Company, St. Anthony, Idaho, will at once construct a power plant at St. Anthony. The plant will have a capacity of 750 hp.

A large milk condensery will be erected at New Plymouth, Idaho, by the Utah Condensed Milk Company, Richmond, Utah. Work on the plant will begin in the immediate future.

Foss Bros., Hadley, Alaska, owners of the Foss

Bros. Lumber Company, recently closed down the plant for needed repairs and alterations. A complete box factory will be added and a large amount of milling machinery will be installed.

Eastern Canada

TORONTO, ONT., January 10, 1914.

The ratepayers of Woodstock, Ont., passed a by-law to grant a loan of \$20,000 to the Concrete Machinery Company, which is associated with the Windsor Motor Company, Woodstock. The loan is to be used in making improvements to the plant.

The ratepayers of Brigidon, Ont., passed a by-law to grant \$4000 for the erection of an electric light plant.

The ratepayers of Norwich, Ont., passed a by-law to grant \$25,000 for the erection of a waterworks system.

The ratepayers of Southampton, Ont., passed a by-law to guarantee the repayment of \$10,000 borrowed by the Steel Furniture & Fittings Company, Ltd. The company will erect a plant at Southampton. Edward Barrelman, of Guelph, Ont., is the head of the company.

A by-law was passed by the ratepayers of Mimico, Ont., granting the Rotary Engine Company exemption from taxes.

The ratepayers of St. Catharines, Ont., passed a by-law to grant a fixed assessment to the Canadian branch of the Russell-Jennings Company. The company will erect a plant at St. Catharines to manufacture augers, bits, tools, etc.

The ratepayers of Richmond Hill, Ont., passed a by-law to grant \$4000 for improvements to the municipal electric light plant.

The ratepayers of Stouffville, Ont., passed a by-law to grant \$5000 to buy the electric power plant and \$2000 to enlarge the plant.

The Handles (wooden goods) factory at Strathroy, Ont., was destroyed by fire with a loss estimated at \$30,000, fully covered by insurance. J. W. Cameron is president of the company.

Sir William Mackenzie has announced that the Canadian Northern has decided upon an expenditure of \$10,000,000 for securing additional rolling stock for the operation of the road between Toronto and Port Arthur. As a result of the opening of the new transcontinental line, one of the largest shops of the road will be erected at Leaside, Toronto.

Considerable damage was done to the Montreal Light, Heat & Power Company by fire.

The most important of the construction work on the new steam auxiliary plant to be erected in the east end of the city by the Dominion Power & Transmission Company, Hamilton, Ont., will be under the direct supervision of the company's officials. W. C. Hawkins has announced that the Canadian Westinghouse Company has been awarded the contract of supplying all the electrical machinery. The Edge Moor Iron Works, Edge Moor, Del., will install the boilers.

The Canadian Pacific Railway Company is preparing to enlarge its elevator capacity at Port McNicol, Ont.

The Peerless Rubber Company, Ltd., Guelph, Ont., has been organized and will erect a factory to manufacture rubber goods. The company's specialty will be the reclaiming of rubber. It will employ 50 hands. H. A. Middleton is head of the company.

Price Brothers, Quebec, Que., will make extensive alterations to their new plant at Kenogami, Que., on account of the original designs not meeting the conditions. They will add two boilers with Dutch ovens to take charge of the waste from the wood room, and a great many other alterations are being made throughout different parts of the plant.

J. E. Carter is a director of a company which will erect a plant in Guelph, Ont., to manufacture tungsten electric lamps.

The construction of a \$55,000 calcining plant for the Iona Gypsum Company, Iona, N. S., will be commenced at once. The mill will be 40 x 60 ft., the warehouse and mixer 40 x 60 ft., and a cooperage shop will be added. The power house is to be 32 x 40 ft. and fitted with a twin battery of Robb-Munford boilers and a

225-hp. compound Corliss engine. The plant when completed will have a capacity of 1400 bbl. of mixed plaster per day.

The Imperial Oil Company, Sarnia, Ont., is erecting a new acid plant in the south end of the city. Acids will be distilled from crude oil.

The Colonial Lumber Company is erecting a plant at Antigonish, N. S., to manufacture hardwood flooring, veneering, wainscoting, etc. The company will commence operations in the early spring. The plant will cost about \$100,000 and will include dry kilns.

A large addition will be made to the hydroelectric station at London, Ont., and new equipment will be added. Mr. Gabey is chief engineer.

The Beaver Coal & Power Company, Ltd., Montreal, has been incorporated with a capital stock of \$1,000,000 by Frederick H. Markey, Waldo W. Skinner, and others, to manufacture patent fuel.

The Caughnawaga Light, Heat & Power Company, Ltd., Caughnawaga, Que., has been incorporated with a capital stock of \$50,000 by Frank M. Jacobs, Jacques Curotte, and others, to manufacture and distribute light, heat and power, etc.

The Colonial Agency Company, Ltd., Montreal, has been incorporated with a capital stock of \$20,000 by Ralph Burnett, Alexander H. Duff, and others, to manufacture machinery for the manufacture of any article.

The Fred W. Evans Company, Ltd., Montreal, has been incorporated with a capital stock of \$125,000 by John W. Blair, Francis J. Laverty, and others, to manufacture fire apparatus.

The Lakes Timber Company, Ltd., Fort Frances, Ont., has been incorporated with a capital stock of \$50,000 by William J. Law, A. U. D. Rahn, and others, to manufacture timber products.

The Northern Canada Supply Company, Ltd., Cobalt, Ont., has been incorporated with a capital stock of \$200,000 by C. J. F. Collier, Arthur B. Mortimer, and others, to manufacture shelf hardware, tools, etc.

The Star & Hydroelectric Company, Ltd., Montreal, has been incorporated with a capital stock of \$399,000 by J. E. Archambault, C. D. Fagenberg, and others.

The Dominion Textile Company, Montmorency Falls, Que., will make extensive additions to its manufacturing facilities, including a new mill requiring the expenditure of \$750,000. Construction will be started early next summer.

The Laurentide Paper Company, Grand Mere, Que., is receiving bids for construction of concrete encasement for a power plant 100 x 400 ft. Townsend & Fleming, Prudential Building, Buffalo, are advisory architects.

Western Canada

WINNIPEG, MAN., January 9, 1914.

No improvement is seen in the machinery business. The volume is reported smaller than at the corresponding time last year, and it is not expected that there will be much betterment before spring. The business being done is chiefly in small lots for repair work. Reports from leading local houses indicate that the amount of business in 1913 has not equaled that of the preceding year by a considerable margin. The financial stringency curtailed industrial expansion in this country, but it is expected that the situation will soon assume normal proportions. Collections are gradually improving. Payments in December were more satisfactory than previously and it is expected that January will show a still further improvement.

The sawmill of the Valley City Lumber Company, Ltd., Valley City, Alberta, recently destroyed by fire, will be rebuilt and considerable new machinery will be added.

The Fort Quappelle Building & Woodworking Company, Ltd., Fort Quappelle, Sask., contemplates the erection of a planing mill in the near future at a cost of about \$42,000.

George H. Green, Green City, near Salmo, B. C., contemplates the erection of a shingle mill in the spring.

Foley, Welch & Stewart, railway contractors, Vancouver, B. C., are preparing to erect a timber and tie mill at Cheakamus, B. C.

J. B. Griffiths, secretary of the Edmonton Portland Cement Company, Ltd., Edmonton, Alberta, announces that plans are being made to enlarge the 1500-bbl. mill at Marlboro, Alberta.

Calgary, Alberta, will erect a municipal abattoir to cost \$125,000.

The Burlington Watch Company, Ltd., Winnipeg, Man., has been incorporated with a capital stock of \$5000 by H. B. Babson, F. K. Babson, of Riverside, Ill., and others.

The Winnipeg Grass Rug Company, Winnipeg, Man., has been incorporated with a capital stock of \$100,000 by C. S. Tupper, E. H. Steiger, Oshkosh, Wis., and others.

R. J. Boyd is making arrangements to start a flour mill at Stettler, Alberta.

Official announcement has been made by Robert Rogers, Minister of Public Works, that the Government has decided to purchase the Bullen site on Lang Cove, Esquimaux, B. C., for the erection of a new \$4,000,000 dry dock, capable of handling the largest ocean liners and battleships. Mr. Rogers has already given orders to prepare the plans for the undertaking and the engineers of the department are at work on them. The new dry dock will be 1150 ft. long and will have 120 ft. clear entrance.

The Westminster Mill Company, New Westminster, B. C., is making plans for the erection of a refuse burner, dry kiln and drying and storage sheds, to cost about \$12,000.

Government Purchases

WASHINGTON, D. C., January 1, 1914.

Bids will be received by the Bureau of Supplies and Accounts, Navy Department, Washington, until January 20, schedule 6223, for a turbo-driven generator for Portsmouth; schedule 6221, for spur geared chain hoists for Brooklyn.

Until January 27, schedule 6184, for six 10-kw. turbo-generating sets for Boston and Norfolk; schedule 6202, for a vertical simplex pump for Puget Sound; schedule 6240, for two ventilating blowers for Norfolk; schedule 6236, for a clam-shell bucket $\frac{3}{4}$ cu. yd. in capacity.

Until February 3, schedule 6251, for an automatic multiple spindle screw machine for Washington; schedule 6231, for a fuel oil-burning apparatus for Puget Sound; schedule 6255, for a steam driven air compressor for Brooklyn; schedule 6256, for a two ton ice-making and refrigerating outfit for Charleston; schedule 6193, for an electric spot welder for Brooklyn.

Until February 10, schedule 6180, for miscellaneous water tube boilers for Brooklyn.

Until February 14, for furnishing and installing on foundations provided by the Government in the central power plants of the navy yards at Mare Island and Puget Sound, two motor-driven fire pumps of 1000 gal. per min. capacity, 400 ft. head, and two steam turbine-driven heating system pumps of 1000 gal. per min. capacity, 150 lb. per sq. in. gauge, head. The estimated cost is \$14,000. Plans and specifications can be obtained on application to the bureau or to the commandants of the navy yards named.

Bids will be received at the office of the depot quartermaster, Jeffersonville, Ind., until January 28, for installing a water power system at the Andersonville National Cemetery, Andersonville, Ga. Address Joseph T. Davidson, major, quartermaster corps, depot quartermaster.

Bids will be received at the office of the quartermaster, Fort Rosecrans, Cal., until February 4, for the extension of the oil pipe line and installation of oil burners in officers' quarters, also a central air plant to all oil burners. Address H. A. McCune, first lieutenant, C. A. C., A. Q. M.

The following award has been made by the general purchasing officer of the Isthmian Canal Commission under circular 800, oil-burning forges and furnaces, thermo-electric pyrometers, bids opened October 8:

W. S. Rockwell Company, class 1, item 20, one oil-burning flanged furnace, \$500.

Trade Publications

Steels.—Philadelphia Steel & Forge Company, 50 Church street, New York City. Catalogue. Deals with a line of crucible and open-hearth steels, both straight carbon and different alloys, which are manufactured in bars, strips and forgings, and forged and rolled shapes. A list of the products is given, followed by brief descriptions of the various grades, considerable information on the properties of the different kinds being included. Hints on heat treating are given, together with classifications of various kinds of steel and a number of tables of weights and decimal equivalents are included. A comprehensive alphabetical index also forms a part of the catalogue.

Road Making Machinery.—Good Roads Machinery Company, Kennett Square, Pa. Collection of bulletins. Describe a number of different types of machines for road making work, including road machines, rock crushers, scrapers, rollers, conveyors, dump cars and wagons, road rollers and oil distributors. All of these are illustrated and briefly described, and in addition to halftone engravings and line drawings of the different machines themselves, in a number of cases views are given of the work accomplished by their use.

Polishing Machinery.—M. Wright & Son Estate, Putnamville, Vt. Two booklets. The first, A, is devoted to the supplies used in the polishing of marble, granite and stone. These include a friction hoist polishing machine, ironing and emery wheels, felt buffers, etc., while the other, B, contains a partial list of the users and a number of testimonial letters.

Swaging Machines.—Excelsior Needle Company, Torrington, Conn. Pamphlet entitled "The Modern Art of Swaging." Shows the Dayton swaging machine, together with some of the work which it can do. After a brief historical account of the development of the art of swaging, followed by a general description of the machine and the dies used, the various sizes of machines are shown with condensed specification tables on the facing pages.

Rotary Pumps.—Harris Pump & Supply Company, 320 Second avenue, Pittsburgh, Pa. Catalogue. Covers a complete line of rotary pumps for circulating, force, storage tank, creamery, lard and other special services. All of the various types are illustrated and briefly described and condensed tables of specifications are given. An index, showing the pages upon which illustrations of different pumps for various special services can be found, is a feature.

Air Compressors.—Ingersoll-Rand Company, 11 Broadway, New York City. Booklet entitled "Story of the Imperial." Features in a brief simplified form the points of superiority maintained in the design and construction of the Imperial line of air compressors. The various phases of construction are described on the different pages, a single one being devoted to each part, with illustrations and a brief description of the various steps in the manufacture of it.

Industrial Heating Furnaces.—W. S. Rockwell Company, 50 Church street, New York City. Bulletin No. 20. Concerned with the various types of furnaces which this company is prepared to furnish for different industrial heating operations. A number of illustrations of these furnaces are given, together with a complete list. The latter includes crucible melting, forge, annealing and case hardening, reverberatory melting, annealing and scaling, muffle, ingot and billet heating, heat treating, bull dozer furnaces, etc. In the list the various types of each kind that can be furnished are mentioned.

Tools.—Rich Tool Company, Railway Exchange Building, Chicago, Ill. Catalogue No. 15 and pamphlet. The catalogue illustrates a line of tools, which includes twist, flat and bonding drills: reamers, track bits, drill and reamer chucks and rivet sets. A single page is devoted to each line with a table of the various sizes which can be supplied under the engraving. Tables giving the decimal equivalents of nominal sizes of drills are given, together with some suggestions for the users of high speed drills. The pamphlet refers to a tungsten valve for use in internal combustion engines, which is claimed not to pit, warp or need regrinding. A saving of from 20 to 30 per cent. on fuel bills is also claimed for the valve.

Automatic Battery Charging Panel.—Roller-Smith Company, 203 Broadway, New York City. Pamphlet. Points out the advantage of using this panel in connection with isolated storage battery lighting plants for tiding over periods of peak and light loads. The various features of the system are briefly touched upon, followed by a description of the panel and the principle upon which it operates. A curve, showing the performance of a 16-cell battery, charged with one of these panels, is included.

Engine Lathes.—Boye & Emmes Machine Tool Company, Cincinnati, Ohio. Wall calendar. Size, 10½ x 15½ in. Each leaf in addition to containing the calendar for one month in heavy black figures, also has an engraving of one

of the company's lathes. These include instantaneous change gear tools, with swings of from 18 to 26 in., standard engine lathes ranging from 18 to 36 in. swing and a 36 and a 48 in. triple geared lathe.

Electrical Supplies.—Detroit Fuse & Mfg. Company, Detroit, Mich. Catalogue No. 22. Lists a line of electrical supplies, including induction motor starters, inclosed entrance and fused switches, indicating inclosed automobile fuses, cut-outs, terminals, contact clips, lugs, etc. All of these are illustrated and briefly described, and a number of dimension tables are included.

Air Extractor.—General Condenser Company, 1239 North Twelfth street, Philadelphia, Pa. Catalogue C. Section 2. Refers to the use of the Airex automatic feed water air extractor, which as the name indicates, is designed to remove the entrained air from the feed water before it enters the boiler. The various advantages, such as the elimination of rusting and corrosion of the boiler and valves and fittings, the avoiding of shocks in pipe lines and a reduction in the capacity of the air pump required are briefly touched upon, after which the construction of the apparatus is described. A number of views showing it installed, both for stationary and marine engine work, are included.

Coach and Truck Wheel Lathes.—Putnam Machine Company, Fitchburg, Mass., Manning, Maxwell & Moore, Inc., 119 West Fortieth street, New York City, general sales agent. Circular. Gives general description and specifications for a 42-in. heavy pattern coach and truck wheel lathe, which has been designed with a view to securing long life, accessibility and the maximum production with the minimum exertion on the part of the operator. A number of special features are embodied in the lathe, including a combination tool slide, which makes it possible to change one tool under ordinary conditions while the other is cutting, thus avoiding a loss of time and an automatic tailstock clamping device by which the tailstock is brought toward the headstock and into the operating position automatically and is then clamped firmly to the bed. This lathe can be supplied with motor or belt drive and a number of outline drawings, showing the arrangement of the motors, pulleys, etc., are included. The text description of the lathe is supplemented by a number of halftone engravings of the different parts.

Gravity Conveying System.—Mathews Gravity Carrier Company, Ellwood City, Pa. Three pamphlets. Deal with a number of gravity conveying devices, which were illustrated in *The Iron Age*, September 4, 1913. These include a straight conveyor for handling boxes, barrels, etc., where there is only a slight grade required and also automatic elevators for taking material from one floor to another. In addition to describing the various devices, the pamphlets are illustrated with views of a number of installations of the apparatus.

Calendar.—Draper Company, Hopedale, Mass. The upper part of the calendar, which measures 11 x 14 in., is occupied by an engraving of the company's Northrop loom and the lower is given over to a 6½ x 9¾-in. calendar pad. In the makeup of the calendar, one leaf is devoted to each month, followed by two sheets with spaces for memoranda.

Vacuum Pumps.—Beach-Russ Company, 220 Broadway, New York City. Bulletin No. 15. Calls attention to a vacuum pump for heating systems which is made of Monel metal. The special advantages claimed for these pumps are the absence of intricate parts to get out of order and the elimination of practically all repairs. The operation of the pump is automatic and the heat can be regulated to suit different temperature conditions. A view of the pump, which can be built for either air line and return line vacuum heating systems, is given, together with a line drawing of the automatic vacuum regulator and starting device.

Power Transmission Machinery.—Dodge Mfg. Company, Mishawaka, Ind. Catalogue No. 106-A14. Supplies in condensed form information and price lists of the standard appliances made by this company. It contains all of the appliances listed in the company's large catalogue. The data contained in this condensed catalogue are such as would be generally used.

Calendar.—Flat Top Fuel Oil Company, Bluefield, W. Va., shipper of Pocahontas coal and coke, has issued a calendar measuring 24½ x 27 in. Noteworthy features of the calendar are the size of the figures used to mark the dates, the giving of the calendar for the preceding and succeeding months and the number of days which have elapsed. The figures are 1¼ in. high and are printed on a contrasting background, each date being blocked in by rules.

Calendar.—Hazard Mfg. Company, Wilkes-Barre, Pa. Calendar hanger measuring 19¼ x 30¼ in., with a pad extending the full width of the hanger and 11 in. high. Calls attention to one of the company's products, railroad signal wires and cables, by showing a view of the signal system installed on the Pennsylvania Railroad, the view being surrounded by a coil of wire rope. Other products are mentioned on the hanger and also on the different leaves.